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NATIONAL DAM SAFETY PROGRAM. MEAD RESERVOIR DAM (INVENTORY NUMB--ETC(U)
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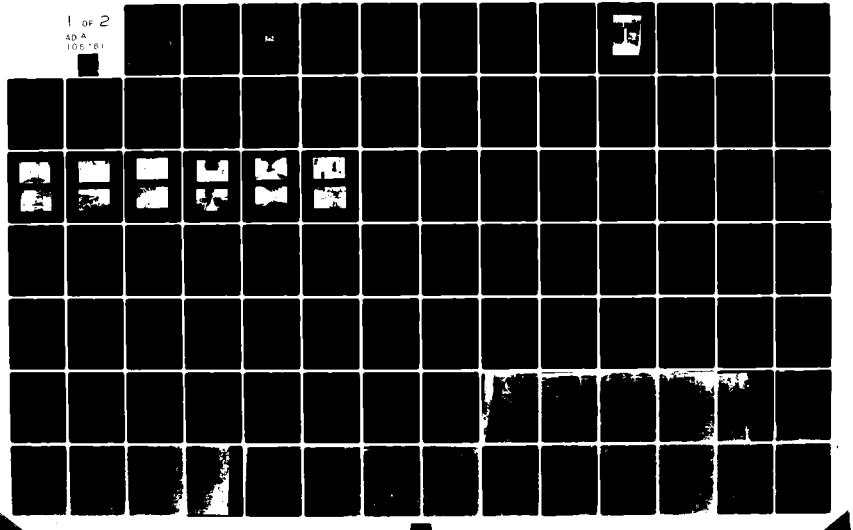

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

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Visual Inspection
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Mead Reservoir Dam
Clinton County
Lake Champlain Basin

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Visual inspection of this dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further engineering investigations.

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An area of concentrated seepage was noted at the downstream toe of the embankment. This area was approximately in line with the concrete gate house. Seepage was emerging at a rate estimated to be 10 to 20 gallons per minute. While only one area of concentrated seepage was noted, the entire area beyond the downstream toe was wet and swampy. Water was flowing out of the hillside in several areas immediately downstream of the embankment- right abutment contact.

The structural stability analysis performed for the spillway section indicates that safety factors are below recommended values for all conditions studied. The sliding safety factors for severe loading conditions such as ice loading or flood flows indicate that the section would be unstable if subjected to these loads.

It is recommended that within 3 months of the date of notification of the owner, investigations into the seepage and structural stability problems should be commenced. Remedial measures which are required based on these investigations should be completed within 18 months.

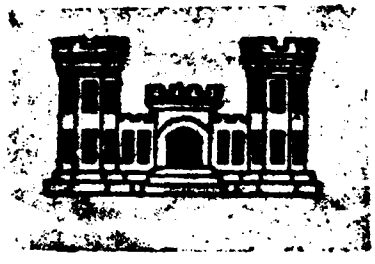
The hydrologic/hydraulic analyses performed indicate that the outflows from all storms exceeding 54% of the Probable Maximum Flood (PMF) will result in flow over the emergency relief weir segment of the embankment. The dam does have sufficient spillway capacity to pass one-half the PMF without the embankment being overtopped. Therefore, the spillway capacity is rated as inadequate.

LAKE CHAMPLAIN BASIN

MEAD RESERVOIR DAM

CLINTON COUNTY, NEW YORK
INVENTORY NO. N.Y. 237

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



NEW YORK DISTRICT CORPS OF ENGINEERS

AUGUST, 1981

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
MEAD RESERVOIR DAM
I.D. NO. NY-237
DEC NO. 218B-236
LAKE CHAMPLAIN BASIN
CLINTON COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Mead Reservoir Dam (I.D. No. NY-237)
State Located:	New York
County:	Clinton
Watershed:	Lake Champlain Basin
Stream:	Mead Brook
Date of Inspection:	June 16, 1981

ASSESSMENT

Visual inspection of this dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further engineering investigations.

An area of concentrated seepage was noted at the downstream toe of the embankment. This area was approximately in line with the concrete gate house. Seepage was emerging at a rate estimated to be 10 to 20 gallons per minute. While only one area of concentrated seepage was noted, the entire area beyond the downstream toe was wet and swampy. Water was flowing out of the hillside in several areas immediately downstream of the embankment- right abutment contact.

The structural stability analysis performed for the spillway section indicates that safety factors are below recommended values for all conditions studied. The sliding safety factors for severe loading conditions such as ice loading or flood flows indicate that the section would be unstable if subjected to these loads.

It is recommended that within 3 months of the date of notification of the owner, investigations into the seepage and structural stability problems should be commenced. Remedial measures which are required based on these investigations should be completed within 18 months.

The hydrologic/hydraulic analyses performed indicate that the outflows from all storms exceeding 54% of the Probable Maximum Flood (PMF) will result in flow over the emergency relief weir segment of the embankment. The dam does have sufficient spillway capacity to pass one-half the PMF without the embankment being overtopped. Therefore, the spillway capacity is rated as inadequate.

Several other deficiencies were noted on this structure. These deficiencies should be corrected within 12 months of the date of notification of the owner. Among the actions required are the following:

1. All trees and brush growing on the dam should be cut to permit a more detailed visual inspection of the embankment.

2. The minor leakage through the upper portion of the spillway gravity section should be eliminated.

3. Grass and weeds growing through the joints between concrete slabs on the spillway discharge exit channel should be removed.

4. The joints between the slabs on the exit channel should be sealed to stop the flow of water beneath the slabs.

5. Debris and sediment in the lower plunge pool should be removed and brush and trees growing immediately downstream of the end of the plunge pool should be cut.

6. An emergency action plan for the notification and evacuation of downstream resident should be developed.

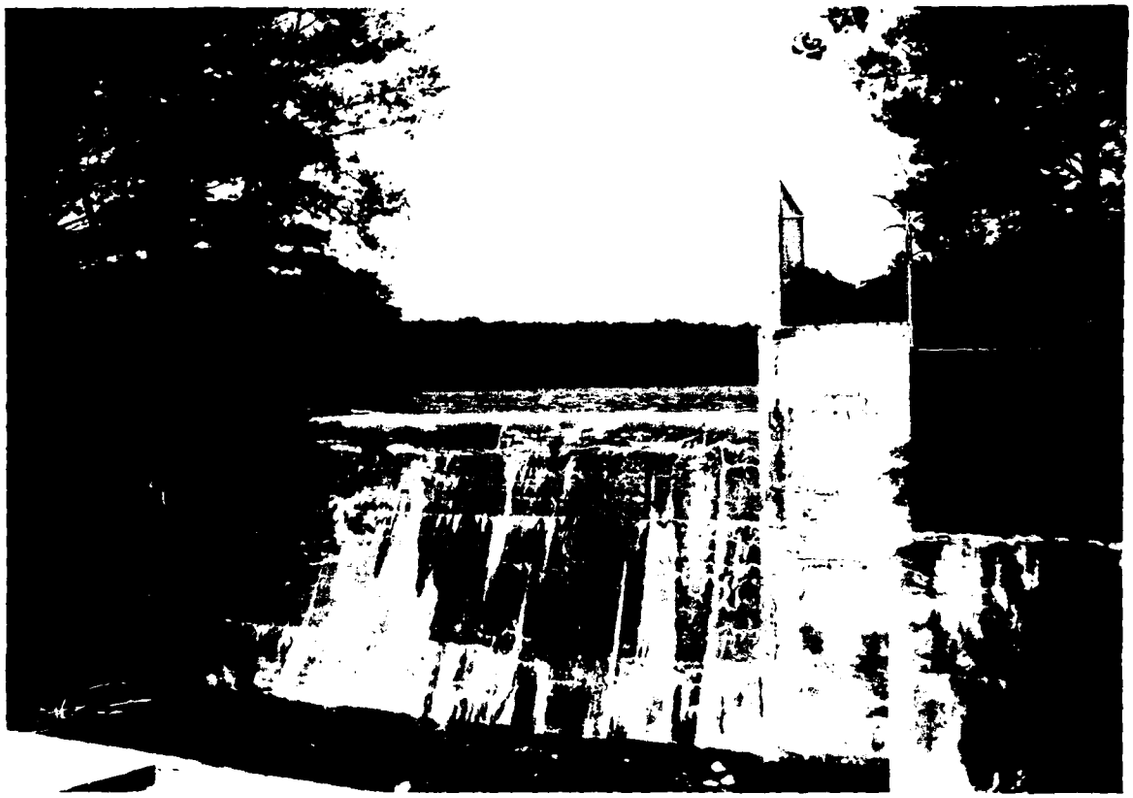
George Koch

George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

Approved By:

Col. W.M. Smith, Jr.
New York District Engineer

Date: 26 Aug 81



OVERVIEW
MEAD RESERVOIR DAM
I.D. NO. NY 237

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
MEAD RESERVOIR DAM
I.D. NO. NY-237
DEC NO. 218B-236
LAKE CHAMPLAIN BASIN
CLINTON COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-237.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

The Mead Reservoir Dam is an earth dam with a concrete core wall. The dam has a concrete gravity overflow spillway section and two low level outlet pipes.

The dam is 673 feet long and a maximum of 65 feet high. The crest width is 12 feet. The upper portion of the upstream slope is 1 vertical on 2 horizontal. The lower portion of this slope is 1 vertical on 3 horizontal. The downstream slope varies from 1 vertical on 1.5 horizontal near the top of the slope to 1 vertical on 3 horizontal at the bottom. On the higher embankment section, there is an 8 foot wide berm near the middle of the downstream slope.

A concrete core wall extends from the spillway section to 75 feet from the right end of the dam. The plans indicate that there is no core wall to the left of the spillway section. The core wall is about 18 inches wide at the base and tapers to 8 inches wide at the top. It is supported on a spread footing located a minimum of 4 feet into natural ground. One 30 foot long segment of the core wall near the spillway section is supported on sheet piling.

The spillway is a 20 foot high, Cyclopean concrete overflow section which is 40 feet long. At the downstream toe of the

gravity section, there is a 20 foot long plunge pool for energy dissipation. A 2 foot wide drainage channel extends from the downstream end of the plunge pool to a point on the outlet channel. This drainage channel is 66 feet long and a maximum of 8 feet deep. The spillway channel below the plunge pool proceeds down the natural slope. The channel is paved with concrete slabs for erosion protection. These slabs are placed on the slope of a trapezoidal cut to form the left side of the spillway channel. The plans indicate that there is an underdrain running down the entire slope beneath these slabs. The right side of the channel is formed by a reinforced concrete retaining wall.

There is another plunge pool at the base of the channel. A vertical concrete wall which is 5 feet high forms the downstream end of this plunge pool. There is a conduit which extends from the right wall in the lower plunge pool to the natural stream channel (a total of about 80 feet). This conduit drains the lower plunge pool during low flows.

There is a circular concrete gatehouse located on the crest of the dam to the right of the spillway section. This gatehouse contains the control mechanisms for three inlet pipes and two low level outlet pipes. There are two 20 inch pipes and one 24 inch pipe, each with a different invert elevation. The intakes to these pipes are concrete structures located in the reservoir The two outlet pipes are a 24 inch pipe which is the main water supply line and another 24 inch pipe leading to a 42 inch concrete blow-off pipe. This 42 inch pipe extends for 175 feet to a headwall just beyond the downstream toe of the dam and outlets into the natural stream channel. There is a concrete box outlet structure at the end of this conduit.

There is an 18 inch conduit which enters the reservoir beyond the right end of the embankment. This pipe permits the diversion of water from the Saranac River into this reservoir.

b. Location

This dam is located off Rand Hill Road in the Town of Plattsburgh, New York. It is about 1 mile north-west of the intersection of Rand Hill Road and New York State Route 3 in the hamlet of West Plattsburgh.

c. Size Classification

This dam is 65 feet high and has a storage capacity of 2827 acre-feet. Therefore, the dam is in the intermediate size category as defined by the "Recommended Guidelines for Safety Inspection of Dams."

d. Hazard Classification

This dam is classified as a high hazard structure due to the presence of two state highway (NY Rte 374 and NY Rte 3) and five homes adjacent to the stream channel downstream of the dam.

e. Ownership

This dam is owned by the City of Plattsburgh, New York. Mr. George M. Miller is the City Engineer. His address is City Hall, Plattsburgh, New York 12901. His phone number is (518-563-7730.)

f. Purpose of Dam

This dam impounds a reservoir used for water supply by the City of Plattsburgh.

g. Design and Construction History

Available correspondence indicates that a dam has existed at this site since the mid-1800's. The original structure was a timber crib dam which partially failed in the early 1900's. This crib dam was completely removed and the dam which presently exists was constructed in 1923. The dam was designed by Metcalf and Eddy, Consulting Engineers of Boston, Massachusetts.

h. Normal Operating Procedures

There are no prescibed operating procedures for this structure. Water is withdrawn from the reservoir as required for water supply.

1.3 PERTINENT DATA

a. Drainage Area (sq. mi.)	6.39
b. Discharge at Dam (cfs)	
Spillway at Maximum High Water	2827
24" Blow-off Pipe (water level at spillway crest)	101
c. Elevation (USGS Datum)*	
Top of Dam	541.5
Crest of Emergency Relief Weir, (Embankment Section)	540.5
Spillway Crest	533.0
Invert of Bottom Low Level Inlet	465.0
* (USGS Datum= Plan Datum + 16.5)	
d. Reservoir - Surface Area (acres)	
Top of Dam (Emergency Relief Weir Crest)	105
Spillway Crest	74
e. Storage Capacity (acre-feet)	
Top of Dam (Emergency Relief Weir Crest)	1895
Spillway Crest	1228

f. Embankment

Type: Compacted zoned earth embankment with concrete core wall; most impervious soil in section surrounding core wall; stone fill segments at both upstream and downstream toe.

Embankment Length (ft)			550
Slopes (V:H)	Upstream-	Upper Slope	1 on 2
		Lower Slope	1 on 3
	Downstream-	Varies from 1 on 1.5 to 1 on 3 (8 ft. Wide berm on higher section)	
Crest Width (ft)			12

g. Corewall

Type: Concrete wall with spread footing buried in existing ground; one 30 ft. long segment supported on sheet piles.

Length: (ft)	(from left end of spillway to 75 feet from right end of dam)	370
Width (in.)	Crest	8
	Base	18

h. Spillway

Type: Ungated Cyclopean concrete overflow section, with plunge pool at toe of gravity section, paved channel down the natural slope, and plunge pool at toe of slope. A conduit drain extends from lower plunge pool over to natural stream channel.

Length of Weir (ft)	40

i. Low Level Inlets/Outlets

(1) Inlets - Two 20 inch pipes and one 24 inch pipe each with a different invert elevation lead from the reservoir to the gatehouse; there is a concrete intake structure in the reservoir for each pipe; flow through each pipe is controlled by valves in the gatehouse

(2) Outlets - Two 24 inch pipes; flow controlled by valves in the gatehouse; one pipe is the main water supply line while the other leads to a 42 inch concrete blow-off pipe; 42 inch conduit is 175 feet long and outlets through a concrete box structure.

j. Appurtenant Structures

(1) Gatehouse - Circular concrete structure located on crest of dam; contains control mechanisms for valves on all the inlet and outlet pipes; another 8 inch diameter pipe leads from sump in gatehouse to the 42 inch pipe; this pipe can drain the gatehouse.

(2) Diversion Inlet - 18 inch pipe outleting at a concrete headwall beyond right end of embankment; pipe allows diversion of water from Saranac River into the reservoir.

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Mead Reservoir Dam is located in the Champlain lowlands physiographic province of New York State. The Champlain Lake Plain is a low, relatively flat area underlain with marine clays and limestone. Drift deposits and peak bogs are common in the northeast portion of the plain. Bedrock in the area is from the Ordovician era (435 to 500 million years ago). A review of the "Brittle Structures Map of New York" indicates that there is a normal fault which runs through the reservoir, approximately 1500 feet to the west of the dam.

Surficial soils in the area are the result of glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation.

b. Subsurface Investigations

There was some subsurface information available for this dam. Logs from 11 test pits were shown on the 1923 plans. These logs indicated that the foundation consists of muck and loam underlain by clay. At the right end of the dam, there was up to 30 feet of sand overlying the clay.

2.2 DESIGN RECORDS

The present dam was designed by Metcalf and Eddy, Consulting Engineers of Boston, Massachusetts. A complete set of plans as well as other design information is available at the City Engineer's office in Plattsburgh. Selected sheets from these plans have been included in Appendix F.

2.3 CONSTRUCTION RECORDS

The dam was constructed in 1923 by the Bluff Point Stone Company. Metcalf and Eddy performed the construction inspection. The available plans are record plans and therefore, represent the as-built condition of the structure.

2.4 OPERATION RECORDS

No operation records are maintained on this structure.

2.5 EVALUATION OF DATA

Information used for the preparation of this report was obtained from the Department of Environmental Conservation files and from the City of Plattsburgh's files. The information available appeared to present reasonably accurate data concerning the structure.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Mead Reservoir Dam was conducted on June 16, 1981. The weather was sunny with the temperature in the eighties. The water level at the time of the inspection was about 6 inches below the spillway crest.

b. Embankment

Visual inspection was hampered by trees, brush and weeds growing on the embankment. The problem was most severe on the lower portion of the downstream slope to the right of the spillway section. A bamboo-like weed completely covered this portion of the slope, making a close inspection impossible. Trees and brush covered the upper portion of this slope and most of the remainder of the embankment as well.

The crest of the embankment was slightly uneven with several minor irregularities noted. At the left end of the dam, the crest of the embankment slopes gradually downward. This segment of the embankment with a lower crest level is called an emergency relief weir on the plans.

Several deficiencies were noted on the downstream slope. The entire area along the downstream toe of the high embankment section (to the right of the spillway section) was wet and swampy. One area of concentrated clear seepage was noted at the toe of the slope approximately in line with the concrete gatehouse. Seepage was emerging at a rate estimated to be 10 to 20 gallons per minute and was forming a small pool of water beyond the toe. The City Engineer was aware of the existence of this seepage and stated that it had been occurring for a long period of time.

There was also water emerging at several points along the natural slope immediately downstream of the contact between the embankment and the right abutment. These points were all below the berm which is located near the middle of the downstream slope. Water was also flowing off the adjacent hillside and into the downstream channel near the concrete headwall at the end of the 42 inch blow-off pipe. It could not be determined whether these flows were the result of seepage through the dam or hillside groundwater.

c. Spillway

The spillway was in satisfactory condition. There were some small cracks in the abutment walls and some spalling on the downstream face of the gravity section. Minor leakage through the gravity section was also noted. This leakage was exiting about 2 feet below the spillway crest. There was some localized erosion on the upstream embankment slope for about 20 feet from the spillway's right abutment. This erosion was believed to be the result of wave action.

A small amount of water was flowing out of the concrete channel which drains the upper plunge pool. This water flowed over the concrete slabs which line the exit channel and then disappeared beneath the slabs. The water then reappeared approximately 50 feet downstream and flowed over the remainder of the slabs. There was grass and weeds growing through the joints between several of the slabs at the lower end of the channel. Some minor cracking was noted on the channel walls. The lower plunge pool was partially filled with sediment and debris. Brush and weeds were growing in this plunge pool as well. There was some debris around the inlet to the lower plunge pool drain conduit. A spring was observed bubbling up through the bottom of the lower plunge pool. This spring was probably related to the underdrain pipes beneath the spillway channel.

d. Low Level Inlets/Outlets

These pipes were unobservable at the time of inspection. The valves which control flow through these pipes are located in the gatehouse on the crest of the dam. These valves are reported to be operational. Mr. St. Clair of the Water and Sewer Department said that all of the valves were operated approximately one month before the Phase I inspection.

The concrete box outlet structure at the outlet end of the 42 inch conduit was visible at the downstream toe of the embankment. This outlet structure and the downstream pool appear to be in satisfactory condition. There was a small stream of water off the hillside which was flowing over the concrete structure and into the pool.

e. Appurtenant Structures - Gatehouse and Diversion Pipe

Both the gatehouse and diversion inlet pipe appeared to be in good condition. Some small cracks were noted in the gatehouse concrete walls.

f. Reservoir

There were no indications of soil instability in the reservoir area.

g. Downstream Channel

The channel below the outlet to the 42 inch blow-off pipe was covered with brush and trees. It was about 15 feet wide and had side slopes of 1 vertical on 1 horizontal.

3.2 EVALUATION OF OBSERVATIONS

Visual inspection revealed several deficiencies on this structure. The following items were noted:

1. Trees, brush and weeds covering most of the embankment, especially the lower portion of the downstream slope to the right of the spillway, making a detailed inspection impossible.

2. One area of concentrated seepage at the downstream toe of the slope approximately in line with the concrete gate house;

3. The overall wet and swampy conditions along the entire downstream toe of the higher embankment section;

4. Several points near the embankment - right abutment contact where water was emerging and flowing off the slope;

5. Minor leakage through the upper portion of the concrete spillway section;

6. Water flowing beneath the concrete slabs on the spillway discharge channel;

7. Grass and weeds growing through some of the joints between slabs on the exit channel;

8. Debris and sediment in the lower plunge pool.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

There are no formal operating proceudres for this dam. Water is withdrawn from the reservoir as required. Water can be diverted from the Saranac River into a small pond and then into Mead Reservoir by means of an 18 inch conduit which outlets through a concrete headwall located beyond the right end of the embankment.

4.2 MAINTENANCE OF DAM

Normal maintenance of the dam is performed by the City of Plattsburgh's Water and Sewer Department. The gates are operated regularly and minor repairs are performed as required.

4.3 WARNING SYSTEM IN EFFECT

No apparent warning system for evacuation of downstream residents is in effect.

4.4 EVALUATION

The operation procedures for this dam are satisfactory. Increased maintenance efforts are needed to repair the deficiencies noted in Section 3.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

Delineation of the watershed for this reservoir was made using the USGS 7.5 minute quadrangle sheets for Morrisonville and West Chazy, New York. The 6.39 square mile drainage area consists of forested lands. The City owns or controls much of the watershed. Relief in the drainage area ranges from steep (slopes of 12%-20%) in the upper reaches to moderate (4%-7.5%) in the vicinity of the reservoir. Hilltops within the watershed rise as much as 1000 feet above the normal reservoir level.

5.2 ANALYSIS CRITERIA

The analysis of the floodwater retarding capability of the dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety version. This program uses the Snyder Snythetic Unit hydrograph and the "Modified Puls" flood routing procedure. The spillway design flood selected for analysis was the Probable Maximum Flood (PMF) in accordance with the recommended guidelines of the U.S. Army Corps of Engineers. The PMF event is that hypothetical storm event resulting from the most critical combination of rainfall, minimum soil retention and direct runoff that is considered reasonably possible for a particular watershed.

5.3 SPILLWAY CAPACITY

The dam has an ungated spillway section. For the purposes of this analysis, it was assumed that there was no flow through the low level inlet/outlet pipes. The spillway is 40 feet long with concrete abutment walls at either end. The spillway was analyzed as a weir with a discharge coefficient C, which varied from 3.2 to 3.72. The effective length of the spillway was reduced to account for the turbulence caused by the abutments. The computed spillway capacity for the water surface at the top of the dam is 2827 cfs.

5.4 RESERVOIR CAPACITY

The normal water surface in the reservoir is at or near the spillway crest elevation. The impounded capacity for this elevation is 1228 acre-feet. Surcharge storage capacity between the spillway crest (elev. 533) and the top of the emergency relief weir (elev. 540.5) is 667 acre-feet which is equivalent to a direct runoff depth of 1.96 inches over the drainage area. The total storage capacity is 1895 acre-feet.

5.5 FLOODS OF RECORD

No information was available regarding the maximum known flood.

5.6 OVERTOPPING POTENTIAL

Analysis indicates that the dam does not have sufficient spillway capacity to adequately discharge the outflows from the PMF. For this storm, the peak inflow is 6580 cfs and the peak outflow is 6136 cfs. The analysis indicates that the emergency relief weir segment of the embankment would be overtopped by all storms exceeding 54% of the PMF. The higher main embankment section would be overtopped by all storms exceeding 67% of the PMF.

For one-half of the PMF, the peak outflow is 2606 cfs. The maximum water surface would be 0.42 feet below the crest of the emergency relief weir.

5.7 EVALUATION

The dam does not have sufficient spillway capacity to discharge the peak outflow from the PMF. The outflows from one-half the PMF will not result in the dam or the emergency relief weir segment being overtopped. Therefore, the spillway capacity of this dam is rated as inadequate.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual inspection of this structure revealed several deficiencies which affect the stability of this structure. Trees and brush covering most of the embankment hampered the inspection. The area along the entire downstream toe was wet and swampy. One area of concentrated seepage was noted. This seep was approximately in-line with the concrete gate house. Water was flowing out of the nearby hillside in several areas immediately downstream of the embankment - right abutment contact.

b. Data Review and Stability Evaluation

No design information concerning the stability of either the earth embankment section or the concrete spillway section was available. The construction plans included cross sections of both segments as well as limited foundation information.

A stability analysis of the spillway section was performed for this report in accordance with the "Recommended Guidelines for Safety Inspection of Dams". The results of the stability analysis are as follows:

Case	Overturning Safety Factor	Resultant in Middle Third	Sliding Safety Factor
a. Normal conditions, water surface at spillway crest	1.58	No	1.12
b. Case a. plus ice load of 5,000 lb/ft	1.14	No	0.81
c. 1/2 PMF Flow; Water surface 7.1 feet over spillway	1.16	No	0.65
d. Water surface at top of relief weir embankment section	1.14	No	0.64
e. Normal conditions with seismic coefficient of 0.10	1.52	No	0.82

These analyses indicate that the spillway section is marginally stable under normal conditions. The sliding safety factor for severe loading condition such as ice loading or flood flows falls below 1.0, indicating that the section would be unstable if subjected to these loads.

Further investigations are required to better assess the stability of the spillway section. Subsurface explorations and concrete cores are

required to obtain information about the structure, the foundation conditions, and the effectiveness of the cutoff wall beneath the spillway section. Stability analyses should then be performed using this data. Based on the results of these analyses, the need for and extent of modifications to the structure should be determined.

c. Seismic Stability

This structure is located in Seismic Zone 3. A seismic stability analysis was performed assuming a seismic coefficient of 0.1. The results of this analysis (shown on page 13) indicate that the safety factors against sliding are below 1.0 when seismic considerations are included. Therefore, when modifications to the structure are made, seismic stability criterial should also be met.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I inspection of the Mead Reservoir Dam revealed several deficiencies on the structure. One area of concentrated seepage was noted at the downstream toe of the embankment. In addition, the entire area beyond the downstream toe was wet and swampy. Water was flowing out of the hillside in several areas immediately downstream of the embankment -right abutment contact. Visual inspection was hampered by trees and brush which cover the entire embankment.

The structural stability analysis performed for the spillway section of this dam indicates that safety factors are below recommended values for all conditions studied. The sliding safety factor for severe loading conditions such as ice loading and flood flows indicates that the section would be unstable if subjected to these loads.

The dam does not have sufficient spillway capacity to pass the Probable Maximum Flood (PMF). The outflows from one-half the PMF will not overtop the dam or the emergency relief weir segment of the embankment. Therefore, the spillway capacity has been rated as inadequate.

b. Adequacy of Information

The information available for the preparation of this report was fairly complete and appeared to be reasonably accurate.

c. Need for Additional Investigations

Further investigation of the structural stability and seepage problems on this dam are required. The structural stability investigations should include subsurface explorations and concrete cores to obtain information about the structure, its foundation conditions, and the effectiveness of the cutoff wall beneath the spillway section. This data should then be incorporated into a detailed stability evaluation and, if necessary, modifications to the structure should then be designed.

Investigations into the causes of the wet areas beyond the downstream toe, with special emphasis on the one area of concentrated seepage, are required. As a result of these investigations, methods of treatment should be devised and implemented.

d. Urgency

Investigations of the structural stability and seepage problems should be commenced within 3 months of the date of notification of the owner. Remedial measures deemed necessary as a result of these investigations should be completed within 18 months. Other deficiencies noted on the structures should be corrected within 12 months.

7.2 RECOMMENDED MEASURES

1. Cut all trees and brush growing on the dam to permit a more detailed visual inspection of the embankment.

2. Design and implement a method of treatment of the wet areas near the downstream toe, especially the one area of concentrated seepage.

3. Modify the spillway structure as necessary based on the structural stability analysis.

4. Eliminate the minor leakage through the upper portion of the concrete gravity section.

5. Remove grass and weeds growing through the joints between slabs on the exit channel.

6. Remove debris and sediment in lower plunge pool on the exit channel, also clear brush and trees growing immediately downstream of the end of the plunge pool.

7. Seal the concrete slabs on the spillway channel to prevent water from flowing between cracks and under the slabs.

8. Develop an emergency action plan for the notification and evacuation of downstream residents.

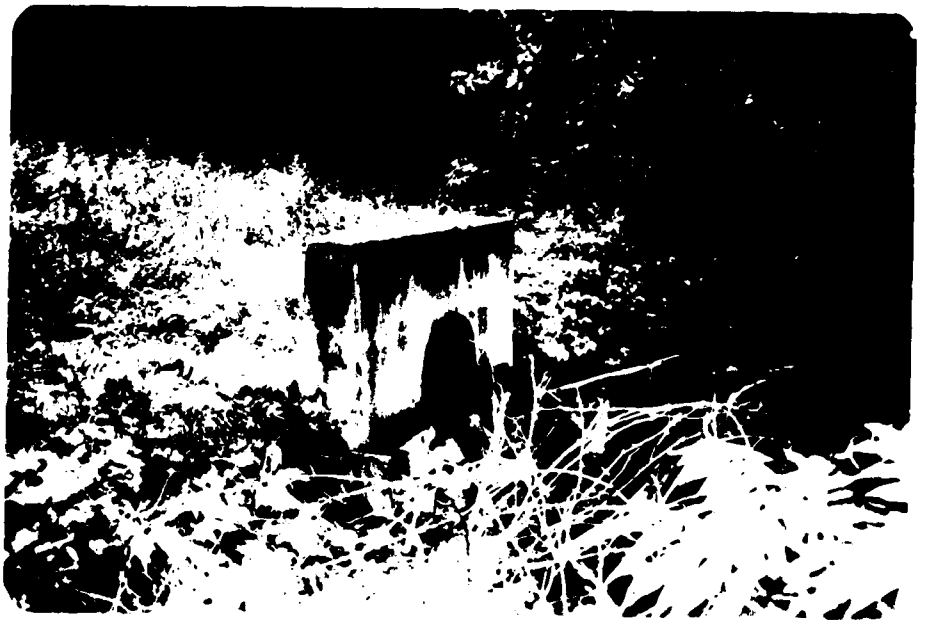
APPENDIX A

PHOTOGRAPHS

CREST OF EMBANKMENT AT LEFT END- LOOKING
TOWARD SECTION CALLED EMERGENCY SPILLWAY WEIR

CREST OF EMBANKMENT AT RIGHT END OF DAM
NOTE TREES ON UPSTREAM SLOPE

CREST AND DOWNSTREAM SLOPE
AT RIGHT END OF DAM



DIVERSION CONDUIT INTO RESERVOIR
AT RIGHT END OF DAM

BAMBOO TYPE WEED GROWTH
ON THE DOWNSTREAM SLOPE

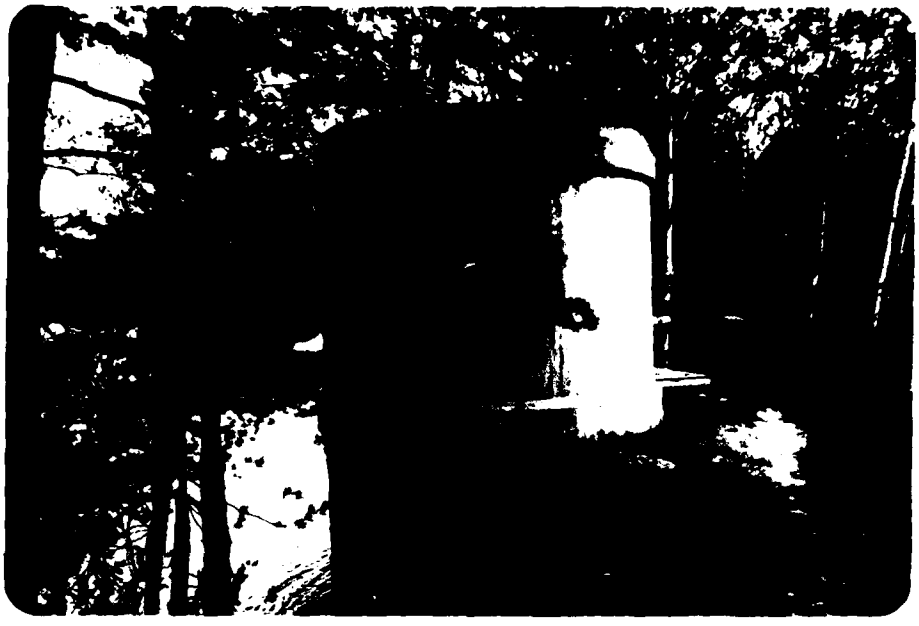
AREA OF CONCENTRATED SEEPAGE
AT DOWNSTREAM TOE OF EMBANKMENT

SPILLWAY SECTION
NOTE LEAKAGE THROUGH DAM NEAR CREST

DRAINAGE CHANNEL FROM UPPER
PLUNGE POOL TO EXIT CHANNEL

SPILLWAY EXIT CHANNEL
NOTE WATER ZOOMING FROM DEFLECTOR SLABS

SPILLWAY EXIT CHANNEL LOOKING DOWNSTREAM
NOTE DEBRIS IN PLUNGE POOL



CONCRETE GATEHOUSE ON CREST OF EMBANKMENT

OUTLET STRUCTURE FOR 42 INCH BLOW-OFF LINE

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam MEAD RESERVOIR DAM

Fed. I.D. # 237 DEC Dam No. 218B-236

River Basin LAKE CHAMPLAIN

Location: Town PLATTSBURGH County CLINTON

Stream Name MEAD BROOK

Tributary of SARANAC RIVER

Latitude (N) 44° 43.4' Longitude (W) 73° 30.6'

Type of Dam EARTH WITH CONCRETE CORE WALL

Hazard Category C

Date(s) of Inspection 6/16/81

Weather Conditions 80° SUNNY

Reservoir Level at Time of Inspection ± 6" BELOW SPILLCREST

b. Inspection Personnel R. WARRENDER, W. LYNICK

c. Persons Contacted (Including Address & Phone No.)

GEORGE MILLER, CITY ENGINEER
CITY HALL
PLATTSBURGH, N.Y. 12901
(518) 563-7730

GARY ST. CLAIR
WATER & SEWER DEPT.
MAIN MILL ST. PLATTSBURGH
(518) 563-1120

d. History:

Date Constructed 1923 Date(s) Reconstructed

Designer METCALF & EDDY, BOSTON, MASS.

Constructed By BLUFF POINT STONE CO.

Owner CITY OF PLATTSBURGH

93-15-3(9/80)

2) Embankment

a. Characteristics

(1) Embankment Material GLACIAL TILL - IMPERVIOUS SOIL NEAREST CENTER

(2) Cutoff Type CONCRETE WALL

(3) Impervious Core CONCRETE CORE WALL

(4) Internal Drainage System NONE

(5) Miscellaneous

b. Crest

(1) Vertical Alignment SLIGHLY IRREGULAR ON RIGHT END - ON LEFT END CREST DROPS GRADUALLY TO FORM RELIEF WIER - ON FILL

(2) Horizontal Alignment SATISFACTORY - CREST IS SOMEWHAT NARROW

(3) Surface Cracks NONE

(4) Miscellaneous TREES & BRUSH AT LEFT END - AT RIGHT END ROOTS FROM LARGE PINE TREES WERE GROWING OVER THE TOP OF THE CORE WALL

c. Upstream Slope

(1) Slope (Estimate) (V:H) 1 ON 2½

(2) Undesirable Growth or Debris, Animal Burrows TREES & BRUSH GROWING ON SLOPE

(3) Sloughing, Subsidence or Depressions SLIGHT SCOUR PROBLEM FOR 20' BEYOND RIGHT END OF SPILLWAY. PROBABLY CAUSED BY WAVE ACTION - LACKS EMBANKMENT MATERIAL BELOW ABUTMENT WALLS - ABOUT 2' DOWN ON EITHER SIDE OF SPILLWAY

↕ 12"-18"

(4) Slope Protection 6"-18" RIPRAP TO ABOUT 1' TO 2' BELOW THE CREST

(5) Surface Cracks or Movement at Toe UNOBSERVABLE

d. Downstream Slope

(1) Slope (Estimate - V:H) FAIRLY STEEP; ESPECIALLY UPPER PART

(2) Undesirable Growth or Debris, Animal Burrows SUBSTANTIAL TREE & BRUSH GROWTH; LOWER PART OF SLOPE IS COVERED WITH KNEE HIGH BAMBOO LIKE GRASS. - MAKES DETAILED INSPECTION IMPOSSIBLE.

(3) Sloughing, Subsidence or Depressions NO EVIDENCE - TREES ON SLOPE ARE RELATIVELY STRAIGHT - NO SIGNS OF SLOPE MOVEMENT.

(4) Surface Cracks or Movement at Toe NONE NOTED

(5) Seepage ~~ENTIRE~~ ONE POINT OF CONCENTRATED SEEPAGE NOTED AT DOWNSTREAM TOE IMMEDIATELY BELOW GATEHOUSE SUBSTANTIAL CLEAR SEEPAGE EXITING IN ONE SPOT RATE ESTIMATED TO BE 10-20 GAL/MIN

(6) External Drainage System (Ditches, Trenches; Blanket) NONE

(7) Condition Around Outlet Structure SOME SEEPAGE INTO POOL - MOSTLY WATER COMING OFF HILL SIDE

(8) Seepage Beyond Toe ENTIRE AREA BEYOND TOE IS WET AND SWAMPY

e. Abutments - Embankment Contact

STEEP CONTACT AT RIGHT ABUT. - OUTLET STRUCTURE IS AT THE TOE IN THIS AREA

93-15-3(9/80)

(1) Erosion at Contact NONE NOTED

(2) Seepage Along Contact SEEPAGE OR GROUND WATER OUT OF HILLSIDE EXITING AT SEVERAL POINTS BELOW THE BERM ELEVATION ONE POINT IS AT BASE OF SLOPE & WATER FLOWS INTO PLUNGE POOL.

3) Drainage System

a. Description of System NONE

b. Condition of System

c. Discharge from Drainage System

4) Instrumentation (Momumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

NONE

93-15-3(9/80)

5) Reservoir

a. Slopes TREED TO EDGE OF RESERVOIR - CITY CONTROLS LAND TO EDGE OF RESERVOIR - LAKE PRIMARILY SPRING FED - LITTLE STREAM FLOW.

b. Sedimentation NOT APPARENT

c. Unusual Conditions Which Affect Dam NONE - USED TO BE A BRIDGE ACROSS TOP OF SPILLWAY BUT IT NO LONGER EXISTS

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) NY RTE 374; NY RTE 3 SEVERAL HOMES BELOW RTE 3 ONE HOME JUST DOWNSTREAM OF DAM

b. Seepage, Unusual Growth ENTIRE AREA BEYOND TOE IS WET

c. Evidence of Movement Beyond Toe of Dam NONE

d. Condition of Downstream Channel 6'-10' DEEP 10'-20' WIDE SIDE SLOPES OF 1 ON 1 LINED WITH BRUSH & TREES

7) Spillway(s) (Including Discharge Conveyance Channel)

CONCRETE GRAVITY SPILLWAY SECTION - PAVED CONCRETE DISCHARGE CHANNEL - 2 PLUNGE POOLS FOR ENERGY DISSIPATION

a. General GRAVITY SECTION - SATISFACTORY - MINOR CRACKS ON ABUTMENT WALLS - MINOR SPALLING ON D.S. FACE - SOME MINOR SEEPAGE THRU CONCRETE EXITING ON DOWNSTREAM FACE 2 FEET ABOVE CREST.

b. Condition of [redacted] Spillway ± PAVED DISCHARGE CHANNEL - SOME WEEDS & GRASS GROWING THROUGH JOINTS BETWEEN SLABS - MINOR CRACKING ON CHANNEL WALLS FLOW FROM UPPER PLUNGE POOL DRAIN CHANNEL FLOWING UNDER SLABS & RE APPEARING ABOUT 50' DOWN SLOPE

c. Condition of Discharge Conveyance Channel GENERALLY SATISFACTORY
PLUNGE POOL AT END OF CHANNEL PARTIALLY FILLED WITH SEDIMENT & DEBRIS. BEYOND END OF PLUNGE POOL THE GROUND IS BRUSH & TREES

d. Structural Condition of Spillway Components
SOME CRACKS & MINOR SPALLING OF CONCRETE ON SPILLWAY SECTION & DISCHARGE CHANNEL

8) LOW LEVEL INLETS/OUTLETS

a. General 3 INLET PIPES & 2 OUTLET PIPES - ALL LEAD TO OR FROM GATE HOUSE VALVES IN GATE HOUSE

b. Condition of Inlets UNOBSERVABLE

c. Condition of Outlets MOSTLY UNOBSERVABLE - ONLY CONCRETE OUTLET STRUCTURE VISIBLE - APPEARED TO BE IN SATISFACTORY CONDITION - SOME SEEPAGE OR WATER OFF HILLSIDE FLOWING ALONG OUTLET STRUCTURE

9) STRUCTURAL - COVERED IN SPILLWAY SECTION

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition

GATE HOUSE - CONTAINS CONTROL MECHANISM FOR INLET & OUTLET PIPES - CONCRETE ON BOTH INTERIOR & EXTERIOR APPEARS TO BE SATISFACTORY WITH ONLY MINOR SURFACE CRACKS

18 INCH DIVERSION PIPE (INFLOW) - HEAD WALL FOR PIPE LOCATED AT RIGHT END OF EMBANKMENT - CONCRETE IN GOOD CONDITION - PIPE DIVERTS WATER FROM SARANAC RIVER TO A SMALL POND AND THEN TO MEAD RESERVOIR.

11) Operation Procedures (Lake Level Regulation):

GRAVITY FED 24" SUPPLY LINE FROM GATE HOUSE TO TREATMENT PLANT - WATER IS WITHDRAWN AS REQUIRED

NORMAL RESERVOIR FLUCUATION IS 2'-3' DURING A VERY DRY SUMMER

MAXIMUM KNOWN FLOOD IS ABOUT 1' OVER THE CREST OF SPILLWAY

WATER TREATMENT PLANT MANNED 18 HOURS PER DAY

TREATMENT PLANT - (518) 563-1188

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation* (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	541.5		
2) ~~Design High Water~~ Top of Emergency Relief Weir (Max. Design Pool)	540.5	105	1895
3) Auxiliary Spillway Crest			
4) Pool Level with Flashboards			
5) Service Spillway Crest	533.0	74	1228

* USGS Datum = Plan Datum + 16.5'

DISCHARGES

	Volume (cfs)
1) Average Daily	—
2) Spillway @ Maximum High Water - Top of Dam	3374
3) Spillway @ Design High Water Top of Relief Weir	2827
4) Spillway @ Auxiliary Spillway Crest Elevation	—
5) Low Level Outlet - 24" Blow off Pipe	101
6) Total (of all facilities) @ Maximum High Water (Top of Relief Wier	2827
7) Maximum Known Flood	—
8) At Time of Inspection	—

CREST: ELEVATION: 540.5

Type: EARTH WITH CONCRETE CORE WALL

Width: 12 FT Length: 673 FT

Spillover CONCRETE OGEE SECTION

Location NEAR RIGHT END OF EMBANKMENT

SPILLWAY:

SERVICE		AUXILIARY
533.0	Elevation	NONE
CONCRETE - MASS	Type	EMERGENCY RELIEF WEIR EMBANKMENT SECTION WOULD PROBABLY FAIL IF SUBJECTED TO OVERTOPPING
4'	Width	
	Type of Control	
✓	Uncontrolled	
	Controlled:	
	Type (Flashboards; gate)	
	Number	
	Size/Length	
	Invert Material	
	Anticipated Length of operating service	
	Chute Length	
	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: _____

Records:

Date - NONE

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

_____

Method of Controlled Releases (mechanisms):

LOW LEVEL OUTLETS - 24" PIPE LEADING TO BLOW OFF & 24" WATER SUPPLY LINE

DRAINAGE AREA: 6.39 Sq Mi 4090 Acres

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: FOREST - City owns Most of Drainage Area

Terrain - Relief: STEEP To MODERATE

Surface - Soil: GLACIAL TILL

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

NONE

Potential Sedimentation problem areas (natural or man-made; present or future)

NONE

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

NONE

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: NONE

Elevation: _____

Reservoir:

Length @ Maximum Pool _____ (Miles)

Length of Shoreline (@ Spillway Crest) _____ (Miles)

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MEAD RESERVOIR DAM NY 237	1		
SUBJECT		**COMPUTED BY**	**DATE**
WATERSHED PARAMETERS		RLW	7/9/81

SNYDER SYNTHETIC UNIT HYDROGRAPH PARAMETERS

$L = 14 in. = 5.40 mi.$

$L_{CA} = 6.7 in. = 2.6 mi.$

USE $C_T = 2.0$

LAG TIME (HRS): $t_p = C_1 (L \times L_{CA})^{0.3}$

$= 2.0(5.4 \times 2.6)^{0.3} = 4.42$ HOURS

UNIT RAINFALL DURATION (HRS): $t_r = \frac{t_p}{5.5}$

$t_r = \frac{4.42}{5.5} = .80$ HRS ← USE 0.50 HRS

ADJUSTED LAG TIME (HRS): $TP = t_p + 0.25(t_R - t_r)$

$= 4.42 + 0.25(0.50 - 0.80)$

$TP = 4.35$

PEAKING COEFFICIENT

USE $C_p = 0.625$

RAINFALL - PMF

REF: HMR #33

ZONE 1 INDEX PMP = 15" (200 SQ MI / 24 HR)

ADJUSTMENT FOR TIME & DA	DURATION	6	12	24	48 - HRS
	% OF INDEX	111	123	133	142

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MEAD RESERVOIR DAM NY237	2		
SUBJECT		**COMPUTED BY**	**DATE**
WATERSHED PARAMETERS		RLW	7/9/81

DRAINAGE AREA - TAKEN FROM 2 USGS 7½ MINUTE QUAD SHEETS - MORRISONVILLE - WEST CHAZY

PLANIMETERED AREAS - MORRISONVILLE QUAD 19.28 IN^2

WEST CHAZY QUAD 25.26 IN^2

44.54 IN^2

$(44.54 IN^2)(91.83 \frac{ACRES}{IN^2}) = 4090$ ACRES $\Rightarrow$ 6.39 SQ. MI

BASE FLOW:

INITIAL AT 1 CSM = 6 CFS

QRCSN = .1 (10% OF PEAK Q)

RTIOR = 1.5

LOSSES (SOIL INFILTRATION)

INITIAL 1.0 CONSTANT 0.1

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PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MEAD RESERVOIR DAM NY 237	3		
SUBJECT		COMPUTED BY	DATE
STAGE-STORAGE DATA		RLW	7/9/81

REF: LOCATION PLAN - SHEET 1 OF 11

PREPARED BY METCALF & EDDY, CONSULTING ENGINEERS

ALL AREAS PLANIMETERED ON THE 1"=200' SCALE PLAN

	ELEVATION*	PLANIMETERED AREA (in^2)	SURFACE AREA (ACRES)
	491.5	3.7	3.4
	506.5	18.6	17.1
	521.5	45.8	42.1
SPILLWAY CREST →	533	80.2	73.6
TOP OF DAM** →	540.5	114.8	105.4

* ELEVATIONS CONVERTED FROM PLAN DATUM TO USGS DATUM

USGS DATUM = PLAN DATUM + 16.5'

** TOP OF EMERGENCY RELIEF WIER WHICH IS PART OF EMBANKMENT

RESERVOIR AREA SHOWN ON USGS QUAD SHEET 69.8 ACRES

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MEAD RESERVOIR DAM NY 237	4		
SUBJECT		**COMPUTED BY**	**DATE**
SPILLWAY DISCHARGES		RLW	7/10/81

WEIR FLOW : $Q = C L H^{3/2}$

ABUTMENT CONTRACTION $L = L' - 2(NK_p + K_a)H \Rightarrow L = 40 - .4H$

$N = 0$

$L' = 40$ FT $K_a = 0.2$

C - VARIES WITH H — USE TABLE 5-13 (KING & BRATER BASED ON MODEL 5-17) (HANDBOOK OF HYDRAULICS 5TH ED

	ELEV	H	L	C	Q (cfs)
SPILLWAY CREST USGS DATUM	533	0	—	—	—
		0.5	39.8	3.20*	45.0
		1.0	39.6	3.40*	134.6
		1.5	39.4	3.60*	280.6
		2.0	39.2	3.67	406.9
		2.5	39.0	3.70	570.4
		3.0	38.8	3.72	750.0
		4.0	38.4	3.72	1142.8
		5.0	38.0	3.72	1580.4
		6.0	37.6	3.72	2055.7
		7.0	37.2	3.72	2562.9
TOP OF DAM (RELIEF WEIR)	540.5	7.5	37.0	3.72	2827.0
TOP OF MAIN EMBANKMENT	541.5	8.5	36.6	3.72	3374.0
		10.0	36.0	3.72	4234.9

* THE COEFFICIENTS FOR THESE LOW HEADS HAVE BEEN REDUCED TO ACCOUNT FOR THE EFFECT OF THE FLAT UPSTREAM FACE

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MEAD RESERVOIR DAM NY 237	5		
SUBJECT		**COMPUTED BY**	**DATE**
LOW LEVEL INLET / OUTLET CAPACITIES		RLW	7/10/31

CALCULATE FLOW THROUGH EACH OF THE INLET PIPES WITH WATER SURFACE AT SPILLWAY CREST (USGS DATUM 533)

UPPER PIPE – 20" DIAMETER CAST IRON PIPE – 35' LONG INVERT 501.0

PIPE FLOW

$$Z + \frac{P_1}{\gamma} + \alpha \frac{V_1^2}{2g} = Z_2 + \frac{P_2}{\gamma} + \alpha \frac{V_2^2}{2g} + \sum h_L$$

$P_1 = 0$ $V_1 \approx 0$ $P_2 = 0$ $h_L = K \frac{V^2}{2g}$

$Z_1 = 533$ $Z_2 = (501 + .833) = 501.83$

$$Z_1 - Z_2 = \alpha \frac{V_2^2}{2g} + \sum K \frac{V_2^2}{2g}$$

$$533 - 501.83 = \frac{V^2}{2g} + [0.5 + 0.525 + 0.19] \frac{V^2}{2g}$$

(0.5 = ENTRANCE LOSS; 0.525 = PIPE LOSS (0.015)(35); 0.19 = GATE LOSS)

$$31.17 = (1 + 11.25) \frac{V^2}{2g} \Rightarrow V = \sqrt{\frac{31.17(2)(32.2)}{12.25}} = 30.10 \text{ FPS}$$

$$Q = VA = (30.10 \text{ FPS})(2.18 \text{ FT}^2) = 65.6 \text{ cfs}$$

MIDDLE PIPE – 20" DIAMETER CAST IRON PIPE – 75' LONG INVERT 485.0

$$533 - 485.83 = \frac{V^2}{2g} + [0.5 + 1.125 + 0.19] \frac{V^2}{2g}$$

(0.5 = ENTRANCE LOSS; 1.125 = PIPE LOSS (.015)(75); 0.19 = GATE LOSS)

$$47.17 = [1 + 1.815] \frac{V^2}{2g} \Rightarrow V = \sqrt{\frac{47.17(2)(32.2)}{2.815}} = 32.8 \text{ FPS}$$

$$Q = VA = (32.8 \text{ FPS})(2.18 \text{ FT}^2) = 71.5 \text{ cfs}$$

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MEAD RESERVOIR DAM NY 367	6		
SUBJECT		**COMPUTED BY**	**DATE**
LOW LEVEL INLET/OUTLET CAPACITIES		RLW	7/10/81

LOWER 24" PIPE - THIS PIPE IS CONECTED TO OUTLET PIPE INVERT 465.0

PIPE IS 135' LONG FROM INTAKE TO GATE HOUSE

3.5' BETWEEN VALVES

8' WITH A BEND TO OUTLET INTO 42" PIPE

$$533 - 466 = \frac{V^2}{2g}\left[0.5 + 2.025 + 0.19 + .053 + 0.9 + 0.12 + .08\right]\frac{V^2}{2g}$$

0.5	2.025	0.19	.053	0.9	0.12	.08
↓	↓	↓	↓	↓	↓	↓
ENTRANCE LOSS	PIPE LOSS (.015)(135)	GATE LOSS	PIPE LOSS (.015)(3.5)	GATE LOSS	PIPE LOSS (.015)(8)	BEND LOSS $\frac{R_D}{D} = \frac{6.5}{2}$ $K_b = .2(4) = .08$ FROM DESIGN OF SMALL DAMS 9.475

$$67 = \left(1 + 3.158\right)\frac{V^2}{2g}$$

$$V = \sqrt{\frac{67.0(2)(32.2)}{4.158}} = 32.2 \text{ FPS}$$

$$Q = VA = (32.2 \text{ FPS})(3.14) = 101.1 \text{ cfs}$$

```
**********                                                    **********
FLOOD HYDROGRAPH PACKAGE (HEC-1)                              NEW YORK STATE
DAM SAFETY VERSION     JULY 1978                              DEPT OF ENVIRONMENTAL CONSERVATION
  LAST MODIFICATION  26 FEB 79                                FLOOD PROTECTION BUREAU
  MODIFIED FOR HONEYWELL APR 79                             **********
**********
    1             A1 MEAD RESERVOIR DAM NY 237
    2             A2 PHASE 1 REPORT
    3             A3 PMF ANALYSIS WITH RATIOS
    4             B    150       0      30       0       0       0       0       0       0       0
    5             B1     5
    6             J      1       6       1
    7             J1   .50     .54     .55     .67     .68    1.0
    8             K              1                                       1
    9             K1  INFLOW HYDROGRAPH
   10             M      1       1    6.39       *                                               1
   11             P             15     111     123     132     142
   12             T                                                   1.0     0.1
   13             W   4.35    .625
   14             X      6      -.1     1.5
   15             K      1       1                       2               1
   16             K1   ROUTED OUTFLOW SPILLWAY CREST ELEV 533  USGS
   17             Y                              1       1
   18             Y1     1                                           -533      -1
   19             Y4   533     534     535     536     537     539     540   540.5   541.5     543
   20             Y5     0   134.6   406.9   750.0  1142.8  2055.7  2562.9  2827.0  3374.0  4234.9
   21             $A   3.4    17.1    42.1    73.6   105.4
   22             $E 491.5   506.5   521.5   533.0   540.5
   23             $$   533
   24             $D 540.5     3.1     1.5     150
   25             K     99
   26             A
   27             A
   28             A
   29             A
   30             A
```

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**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
  MODIFIED FOR HONEYWELL APR 79
**********

**********
NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU
**********

RUN  DATE 07/10/81
                    MEAD RESERVOIR DAM NY 237
                    PHASE 1 REPORT
                    PMF ANALYSIS WITH RATIOS

                                  JOB SPECIFICATION
      NQ      NHR     NMIN     IDAY     IHR     IMIN    METRC     IPLT     IPRT    NSTAN
     150        0       30        0       0        0        0        0        0        0
                                JOPER      NWT   LROPT   TRACE
                                    5        0       0       0

                          MULTI-PLAN ANALYSES TO BE PERFORMED
                                NPLAN= 1 NRTIO= 6 LRTIO= 1
               RTIOS=   0.50    0.54    0.55    0.67    0.68    1.00

**********      **********      **********      **********      **********

                          SUB-AREA RUNOFF COMPUTATION

          INFLOW HYDROGRAPH
                       ISTAQ   ICOMP   IECON   ITAPE   JPLT    JPRT    INAME   ISTAGE   IAUTO
                           1       0       0       0       0       0       1       0        0

                                HYDROGRAPH DATA
          IHYDG     IUHG    TAREA     SNAP    TRSDA    RSPC    RATIO    ISNOW    ISAME    LOCAL
              1        1     6.39       0.     6.39     0.       0.         0        1        0

                                  PRECIP DATA
                      SPFE     PMS       R6      R12      R24      R48      R72      R96
                      0.     15.00   111.00   123.00   132.00   142.00     0.       0.
TRSPC COMPUTED BY THE PROGRAM IS 0.800

                                  LOSS DATA
        LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
            0     0.      0.     1.00     0.      0.     1.00    1.00    0.10     0.      0.

                              UNIT HYDROGRAPH DATA
                          TP=  4.35    CP=0.63    NTA=  0

                                RECESSION DATA
                          STRTQ=    6.00    QRCSN=   -0.10    RTIOR= 1.50
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 9.79 AND R= 8.04 INTERVALS

                UNIT HYDROGRAPH 48 END-OF-PERIOD ORDINATES, LAG=   4.35 HOURS, CP= 0.63  VOL= 1.00
     22.      83.     167.     262.     365.     462.     538.     586.     606.     588.
    534.     472.     417.     368.     325.     287.     253.     224.     197.     174.
    154.     136.     120.     106.      93.      83.      73.      64.      57.      50.
     44.      39.      35.      30.      27.      24.      21.      19.      16.      14.
     13.      11.      10.       9.       8.       7.       6.       5.

  0                                END-OF-PERIOD FLOW
```

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	0.30	1	0.00	0.	0.00	6.
1.01	1.00	2	0.00	0.	0.00	6.
1.01	1.30	3	0.00	0.	0.00	5.
1.01	2.00	4	0.00	0.	0.00	5.
1.01	2.30	5	0.00	0.	0.00	5.
1.01	3.00	6	0.00	0.	0.00	5.
1.01	3.30	7	0.00	0.	0.00	5.
1.01	4.00	8	0.00	0.	0.00	4.
1.01	4.30	9	0.00	0.	0.00	4.
1.01	5.00	10	0.00	0.	0.00	4.
1.01	5.30	11	0.00	0.	0.00	4.
1.01	6.00	12	0.00	0.	0.00	4.
1.01	6.30	13	0.01	0.	0.01	4.
1.01	7.00	14	0.01	0.	0.01	3.
1.01	7.30	15	0.01	0.	0.01	3.
1.01	8.00	16	0.01	0.	0.01	3.
1.01	8.30	17	0.01	0.	0.01	3.
1.01	9.00	18	0.01	0.	0.01	3.
1.01	9.30	19	0.01	0.	0.01	3.
1.01	10.00	20	0.01	0.	0.01	3.
1.01	10.30	21	0.01	0.	0.01	3.
1.01	11.00	22	0.01	0.	0.01	2.
1.01	11.30	23	0.01	0.	0.01	2.
1.01	12.00	24	0.01	0.	0.01	2.
1.01	12.30	25	0.05	0.	0.05	2.
1.01	13.00	26	0.05	0.	0.05	2.
1.01	13.30	27	0.06	0.	0.06	2.
1.01	14.00	28	0.06	0.	0.06	2.
1.01	14.30	29	0.08	0.	0.08	2.
1.01	15.00	30	0.08	0.	0.08	2.
1.01	15.30	31	0.09	0.	0.09	2.
1.01	16.00	32	0.29	0.	0.29	2.
1.01	16.30	33	0.07	0.	0.07	2.
1.01	17.00	34	0.07	0.01	0.06	2.
1.01	17.30	35	0.06	0.01	0.05	3.
1.01	18.00	36	0.06	0.01	0.05	4.
1.01	18.30	37	0.00	0.	0.00	6.
1.01	19.00	38	0.00	0.	0.00	8.
1.01	19.30	39	0.00	0.	0.00	10.
1.01	20.00	40	0.00	0.	0.00	12.
1.01	20.30	41	0.00	0.	0.00	13.
1.01	21.00	42	0.00	0.	0.00	14.
1.01	21.30	43	0.00	0.	0.00	14.
1.01	22.00	44	0.00	0.	0.00	14.
1.01	22.30	45	0.00	0.	0.00	13.
1.01	23.00	46	0.00	0.	0.00	11.
1.01	23.30	47	0.00	0.	0.00	10.
1.02	0.	48	0.00	0.	0.00	9.
1.02	0.30	49	0.04	0.	0.04	8.
1.02	1.00	50	0.04	0.	0.04	7.
1.02	1.30	51	0.04	0.	0.04	6.
1.02	2.00	52	0.04	0.	0.04	6.
1.02	2.30	53	0.04	0.	0.04	5.
1.02	3.00	54	0.04	0.	0.04	5.
1.02	3.30	55	0.04	0.	0.04	4.
1.02	4.00	56	0.04	0.	0.04	4.
1.02	4.30	57	0.04	0.	0.04	3.
1.02	5.00	58	0.04	0.	0.04	3.
1.02	5.30	59	0.04	0.	0.04	3.
1.02	6.00	60	0.04	0.	0.04	2.
1.02	14.00	76	0.80	0.75	0.05	732.
1.02	14.30	77	1.00	0.95	0.05	976.
1.02	15.00	78	1.00	0.95	0.05	1295.
1.02	15.30	79	1.21	1.16	0.05	1689.
1.02	16.00	80	3.85	3.80	0.05	2212.
1.02	16.30	81	0.93	0.88	0.05	2887.
1.02	17.00	82	0.93	0.88	0.05	3642.
1.02	17.30	83	0.73	0.68	0.05	4409.
1.02	18.00	84	0.73	0.68	0.05	5149.
1.02	18.30	85	0.05	0.00	0.05	5796.
1.02	19.00	86	0.05	0.00	0.05	6269.
1.02	19.30	87	0.05	0.00	0.05	6533.
1.02	20.00	88	0.05	0.00	0.05	6560.
1.02	20.30	89	0.05	0.00	0.05	6391.
1.02	21.00	90	0.05	0.00	0.05	5993.
1.02	21.30	91	0.05	0.00	0.05	5490.
1.02	22.00	92	0.05	0.00	0.05	4961.
1.02	22.30	93	0.05	0.00	0.05	4430.
1.02	23.00	94	0.05	0.00	0.05	3926.
1.02	23.30	95	0.05	0.00	0.05	3470.
1.03	0.	96	0.05	0.00	0.05	3067.
1.03	0.30	97	0.	0.	0.	2712.
1.03	1.00	98	0.	0.	0.	2398.
1.03	1.30	99	0.	0.	0.	2120.
1.03	2.00	100	0.	0.	0.	1875.
1.03	2.30	101	0.	0.	0.	1657.
1.03	3.00	102	0.	0.	0.	1465.
1.03	3.30	103	0.	0.	0.	1294.
1.03	4.00	104	0.	0.	0.	1143.
1.03	4.30	105	0.	0.	0.	1010.
1.03	5.00	106	0.	0.	0.	892.
1.03	5.30	107	0.	0.	0.	787.
1.03	6.00	108	0.	0.	0.	695.
1.03	6.30	109	0.	0.	0.	644.
1.03	7.00	110	0.	0.	0.	618.
1.03	7.30	111	0.	0.	0.	594.
1.03	8.00	112	0.	0.	0.	570.
1.03	8.30	113	0.	0.	0.	547.
1.03	9.00	114	0.	0.	0.	526.
1.03	9.30	115	0.	0.	0.	505.
1.03	10.00	116	0.	0.	0.	485.
1.03	10.30	117	0.	0.	0.	465.
1.03	11.00	118	0.	0.	0.	447.
1.03	11.30	119	0.	0.	0.	429.
1.03	12.00	120	0.	0.	0.	412.
1.03	12.30	121	0.	0.	0.	396.
1.03	13.00	122	0.	0.	0.	380.
1.03	13.30	123	0.	0.	0.	365.
1.03	14.00	124	0.	0.	0.	350.
1.03	14.30	125	0.	0.	0.	336.
1.03	15.00	126	0.	0.	0.	323.
1.03	15.30	127	0.	0.	0.	310.
1.03	16.00	128	0.	0.	0.	298.
1.03	16.30	129	0.	0.	0.	286.
1.03	17.00	130	0.	0.	0.	275.
1.03	17.30	131	0.	0.	0.	264.
1.03	18.00	132	0.	0.	0.	253.
1.03	18.30	133	0.	0.	0.	243.
1.03	19.00	134	0.	0.	0.	234.
1.03	19.30	135	0.	0.	0.	224.

1.02	6.30	61	0.12	0.07	0.05	4.	1.03	20.00	136	0.	0.	0.	210.
1.02	7.00	62	0.12	0.07	0.05	9.	1.03	20.30	137	0.	0.	0.	207.
1.02	7.30	63	0.12	0.07	0.05	21.	1.03	21.00	138	0.	0.	0.	199.
1.02	8.00	64	0.12	0.07	0.05	39.	1.03	21.30	139	0.	0.	0.	191.
1.02	8.30	65	0.12	0.07	0.05	64.	1.03	22.00	140	0.	0.	0.	183.
1.02	9.00	66	0.12	0.07	0.05	97.	1.03	22.30	141	0.	0.	0.	176.
1.02	9.30	67	0.12	0.07	0.05	134.	1.03	23.00	142	0.	0.	0.	169.
1.02	10.00	68	0.12	0.07	0.05	175.	1.03	23.30	143	0.	0.	0.	162.
1.02	10.30	69	0.12	0.07	0.05	217.	1.04	0.	144	0.	0.	0.	156.
1.02	11.00	70	0.12	0.07	0.05	258.	1.04	0.30	145	0.	0.	0.	150.
1.02	11.30	71	0.12	0.07	0.05	296.	1.04	1.00	146	0.	0.	0.	144.
1.02	12.00	72	0.12	0.07	0.05	329.	1.04	1.30	147	0.	0.	0.	138.
1.02	12.30	73	0.67	0.62	0.05	370.	1.04	2.00	148	0.	0.	0.	132.
1.02	13.00	74	0.67	0.62	0.05	441.	1.04	2.30	149	0.	0.	0.	127.
1.02	13.30	75	0.80	0.75	0.05	558.	1.04	3.00	150	0.	0.	0.	122.
									SUM	17.04	13.63	3.41	120515.
										(433.)(	346.)(	87.)(	3412.60)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6580.	5482.	2324.	836.	120446.
CMS	186.	155.	66.	24.	3411.
INCHES		7.98	13.53	14.61	14.61
MM		202.70	343.78	371.06	371.14
AC-FT		2718.	4610.	4976.	4977.
THOUS CU M		3353.	5687.	6138.	6139.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

3.	3.	3.	3.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	3.	4.	5.	6.
7.	7.	7.	7.	6.	6.	5.	4.	4.	4.
3.	3.	3.	2.	2.	2.	2.	1.	1.	1.
2.	5.	10.	19.	32.	48.	67.	88.	109.	129.
148.	164.	185.	220.	279.	366.	488.	648.	845.	1106.
1443.	1821.	2205.	2575.	2898.	3135.	3266.	3290.	3195.	2996.
2745.	2480.	2215.	1963.	1735.	1534.	1356.	1199.	1060.	937.
829.	732.	647.	572.	505.	446.	394.	348.	322.	309.
297.	285.	274.	263.	252.	242.	233.	223.	215.	206.
198.	190.	182.	175.	168.	162.	155.	149.	143.	137.
132.	127.	122.	117.	112.	108.	103.	99.	95.	92.
88.	84.	81.	78.	75.	72.	69.	66.	64.	61.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3290.	2741.	1162.	418.	60225.
CMS	93.	78.	33.	12.	1705.
INCHES		3.99	6.77	7.30	7.31
MM		101.35	171.89	185.53	185.57
AC-FT		1359.	2305.	2488.	2489.
THOUS CU M		1677.	2843.	3069.	3070.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

3.	3.	3.	3.	3.	3.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	3.	4.	5.	6.
7.	8.	8.	7.	7.	6.	5.	5.	4.	4.
3.	3.	3.	2.	2.	2.	2.	2.	1.	1.

2.	5.	11.	21.	35.	[illegible]	72.	96.	117.	[illegible]
160.	178.	200.	238.	301.	395.	527.	699.	912.	1195.
1559.	1967.	2381.	2781.	3130.	3385.	3528.	3555.	3451.	3256.
2965.	2679.	2392.	2120.	1874.	1656.	1465.	1295.	1145.	1012.
895.	791.	699.	617.	545.	481.	425.	375.	348.	334.
321.	308.	296.	284.	273.	262.	251.	241.	232.	223.
214.	205.	197.	189.	182.	174.	168.	161.	154.	148.
142.	137.	131.	126.	121.	116.	112.	107.	103.	99.
95.	91.	88.	84.	81.	78.	74.	72.	69.	66.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3553.	2960.	1255.	452.	65041.
CMS	101.	84.	36.	13.	1842.
INCHES		4.31	7.31	7.89	7.89
MM		109.46	185.64	200.37	200.41
AC-FT		1468.	2490.	2687.	2688.
THOUS CU M		1811.	3071.	3314.	3315.

HYDROGRAPH AT SJA 1 FOR PLAN 1, RTIO 3

3.	3.	3.	3.	3.	3.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	3.	4.	6.	7.
7.	8.	8.	8.	7.	6.	6.	5.	4.	4.
3.	3.	3.	2.	2.	2.	2.	2.	1.	1.
2.	5.	11.	21.	35.	53.	74.	96.	120.	142.
163.	181.	203.	242.	307.	405.	537.	712.	929.	1217.
1588.	2003.	2425.	2832.	3188.	3448.	3593.	3619.	3515.	3296.
3020.	2728.	2437.	2159.	1908.	1687.	1492.	1319.	1166.	1031.
912.	806.	712.	629.	555.	490.	433.	382.	354.	340.
326.	313.	301.	289.	278.	267.	256.	246.	236.	227.
218.	209.	201.	193.	185.	178.	171.	164.	157.	151.
145.	139.	134.	128.	123.	118.	114.	109.	105.	101.
97.	93.	89.	86.	82.	79.	76.	73.	70.	67.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3619.	3015.	1278.	460.	66245.
CMS	102.	85.	36.	13.	1876.
INCHES		4.39	7.44	8.03	8.04
MM		111.49	189.08	204.08	204.13
AC-FT		1495.	2536.	2737.	2737.
THOUS CU M		1844.	3128.	3376.	3377.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 4

4.	4.	4.	3.	3.	3.	3.	3.	3.	3.
3.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	3.	4.	5.	7.	8.
9.	10.	10.	9.	8.	8.	7.	6.	5.	5.
4.	4.	3.	3.	3.	2.	2.	2.	2.	2.
2.	6.	14.	26.	43.	65.	90.	117.	146.	173.
198.	220.	248.	295.	374.	490.	654.	868.	1132.	1482.
1934.	2440.	2954.	3450.	3883.	4200.	4377.	4408.	4282.	4015.
3678.	3324.	2968.	2630.	2325.	2055.	1817.	1607.	1421.	1256.
1110.	981.	867.	766.	677.	597.	527.	466.	431.	414.
398.	382.	367.	352.	338.	325.	312.	299.	288.	276.
265.	255.	244.	235.	225.	216.	208.	200.	192.	184.
177.	170.	163.	157.	150.	144.	139.	133.	128.	123.
118.	113.	109.	104.	100.	96.	92.	89.	85.	82.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4408.	3675.	1557.	560.	80699.
CMS	125.	104.	44.	16.	2285.
INCHES		5.35	9.07	9.79	9.79
MM		135.81	230.33	248.61	248.66
AC-FT		1821.	3089.	3334.	3335.
THOUS CU M		2247.	3810.	4112.	4113.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 5

4.	4.	4.	3.	3.	3.	3.	3.	3.	3.
3.	3.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	3.	4.	5.	7.	8.
9.	10.	10.	9.	9.	8.	7.	6.	5.	5.
4.	4.	3.	3.	3.	2.	2.	2.	2.	2.
2.	6.	14.	26.	44.	66.	91.	119.	148.	176.
201.	224.	252.	300.	379.	496.	663.	881.	1149.	1504.
1963.	2476.	2998.	3501.	3941.	4263.	4442.	4474.	4346.	4075.
3733.	3373.	3013.	2670.	2360.	2086.	1844.	1631.	1442.	1275.
1127.	996.	880.	778.	687.	606.	535.	473.	438.	420.
404.	388.	372.	357.	343.	330.	316.	304.	292.	280.
269.	258.	248.	238.	229.	220.	211.	203.	195.	187.
179.	172.	165.	159.	153.	146.	141.	135.	130.	125.
120.	115.	110.	106.	102.	98.	94.	90.	86.	83.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4474.	3728.	1581.	569.	81903.
CMS	127.	106.	45.	16.	2319.
INCHES		5.43	9.20	9.93	9.94
MM		137.84	233.77	252.32	252.37
AC-FT		1848.	3135.	3384.	3384.
THOUS CU M		2280.	3867.	4174.	4175.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 6

6.	6.	5.	5.	5.	5.	5.	4.	4.	4.
4.	4.	4.	3.	3.	3.	3.	3.	3.	3.
3.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	3.	4.	6.	8.	10.	12.
13.	14.	14.	14.	13.	11.	10.	9.	8.	7.
6.	6.	5.	5.	4.	4.	3.	3.	3.	2.
4.	9.	21.	39.	64.	97.	134.	175.	217.	258.
296.	329.	370.	441.	558.	732.	976.	1295.	1689.	2212.
2887.	3642.	4409.	5149.	5796.	6269.	6533.	6580.	6391.	5993.
5490.	4961.	4430.	3926.	3470.	3067.	2712.	2398.	2120.	1875.
1657.	1465.	1294.	1143.	1010.	892.	787.	695.	644.	618.
594.	570.	547.	526.	505.	485.	465.	447.	429.	412.
396.	380.	365.	350.	336.	323.	310.	298.	286.	275.
264.	253.	243.	234.	224.	215.	207.	199.	191.	183.
176.	169.	162.	156.	150.	144.	138.	132.	127.	122.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6580.	5482.	2324.	836.	120446.
CMS	186.	155.	66.	24.	3411.
INCHES		7.98	13.53	14.61	14.61
MM		202.70	343.78	371.06	371.14
AC-FT		2718.	4610.	4976.	4977.
THOUS CU M		3353.	5687.	6138.	6139.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED OUTFLOW SPILLWAY CREST ELEV 533 USGS

ISTAQ	ICOMP	ICON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	2	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.	0.	0.	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.	0.	0.	-533.	-1

STAGE	533.00	534.00	535.00	536.00	537.00	539.00	540.00	540.50	541.50	543.00
FLOW	0.	134.60	406.90	750.00	1142.80	2055.70	2562.90	2827.00	3374.00	4234.90
SURFACE AREA=	3.	17.	42.	74.	105.					
CAPACITY=	0.	141.	571.	1228.	1895.					
ELEVATION=	492.	507.	522.	533.	541.					

CREL	SPWID	COOW	EXPW	ELEVL	COOL	CAREA	EXPL
533.0	0.	0.	0.	0.	0.	0.	0.

DAM DATA

TOPEL	COOD	EXPD	DAMWID
540.5	3.1	1.5	150.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
2.	3.	3.	3.	3.	4.	4.	4.	4.	4.
4.	4.	4.	4.	3.	3.	3.	3.	3.	3.
3.	3.	3.	4.	6.	8.	12.	16.	22.	29.
37.	46.	55.	65.	78.	96.	119.	164.	242.	339.
472.	654.	877.	1131.	1430.	1720.	1983.	2224.	2416.	2542.
2604.	2606.	2557.	2470.	2354.	2218.	2071.	1930.	1788.	1646.
1507.	1372.	1245.	1127.	1029.	935.	847.	765.	698.	639.
586.	540.	499.	462.	430.	402.	381.	361.	342.	325.
309.	294.	280.	266.	254.	242.	231.	220.	211.	201.
192.	184.	176.	168.	161.	154.	148.	141.	135.	132.
129.	126.	123.	120.	117.	114.	111.	108.	105.	102.

STORAGE

1228.	1228.	1228.	1228.	1228.	1228.	1228.	1228.	1228.	1228.
1228.	1228.	1228.	1228.	1228.	1228.	1228.	1228.	1228.	1228.
1228.	1228.	1228.	1228.	1228.	1228.	1228.	1228.	1228.	1228.
1228.	1228.	1228.	1228.	1228.	1228.	1228.	1228.	1229.	1229.
1229.	1229.	1229.	1229.	1230.	1230.	1230.	1230.	1230.	1230.

1230.	1230.	1230.	1230.	1230.	1230.	1229.	1229.	1229.	1229.
1229.	1224.	1229.	1230.	1231.	1232.	1234.	1237.	1240.	1244.
1248.	1253.	1258.	1264.	1271.	1281.	1294.	1312.	1334.	1362.
1398.	1443.	1494.	1551.	1612.	1671.	1727.	1775.	1813.	1839.
1851.	1852.	1842.	1824.	180 .	1774.	1745.	1715.	1685.	1656.
1627.	1600.	1574.	1550.	1528.	1507.	1488.	1470.	1453.	1439.
1426.	1415.	1405.	1396.	1388.	1381.	1375.	1369.	1364.	1358.
1354.	1349.	1345.	1341.	1338.	1334.	1331.	1328.	1325.	1322.
1320.	1317.	1315.	1313.	1311.	1309.	1307.	1305.	1303.	1302.
1300.	1298.	1297.	1295.	1293.	1291.	1290.	1288.	1286.	1285.

STAGE

533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.0	533.0	533.1	533.1	533.1	533.2	533.2
533.3	533.3	533.4	533.5	533.6	533.7	533.9	534.1	534.4	534.8
535.2	535.7	536.3	537.0	537.6	538.3	538.8	539.3	539.7	540.0
540.1	540.1	540.0	539.8	539.6	539.3	539.0	538.7	538.4	538.1
537.8	537.5	537.2	537.0	536.7	536.5	536.2	536.0	535.8	535.7
535.5	535.4	535.3	535.2	535.1	535.0	534.9	534.8	534.8	534.7
534.6	534.6	534.5	534.5	534.4	534.4	534.4	534.3	534.3	534.2
534.2	534.2	534.2	534.1	534.1	534.1	534.0	534.0	534.0	534.0
534.0	533.9	533.9	533.9	533.9	533.8	533.8	533.8	533.8	533.8

PEAK OUTFLOW IS 2606. AT TIME 46.00 HOURS

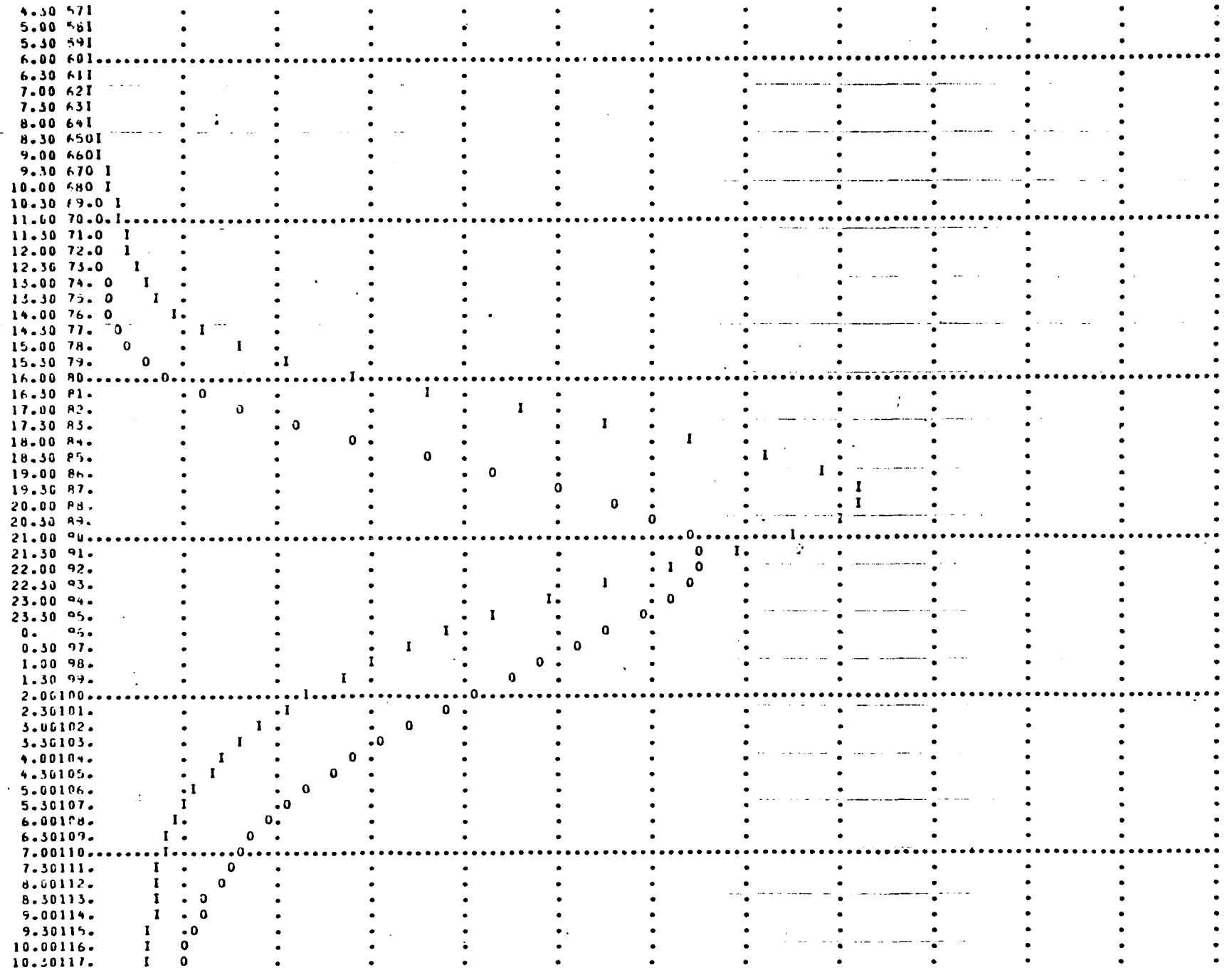
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2606.	2323.	1133.	409.	58853.
CMS	74.	66.	32.	12.	1667.
INCHES		3.38	6.60	7.14	7.14
MM		85.90	167.64	181.34	181.35
AC-FT		1152.	2243.	2432.	2432.
THOUS CU M		1421.	2773.	3000.	3000.

OVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

	0.	400.	800.	1200.	1600.	2000.	2400.	2800.	3200.	3600.	0.	0.	0.
0.30	1I												
1.00	2I												
1.30	3I												
2.00	4I												
2.30	5I												
3.00	6I												
3.30	7I												
4.00	8I												
4.30	9I												
5.00	10I												
5.30	11I												
6.00	12I												
6.30	13I												
7.00	14I												
7.30	15I												
8.00	16I												
8.30	17I												
9.00	18I												
9.30	19I												
10.00	20I												
10.30	21I												
11.00	22I												
11.30	23I												
12.00	24I												
12.30	25I												
13.00	26I												
13.30	27I												
14.00	28I												
14.30	29I												
15.00	30I												
15.30	31I												
16.00	32I												
16.30	33I												
17.00	34I												
17.30	35I												
18.00	36I												
18.30	37I												
19.00	38I												
19.30	39I												
20.00	40I												
20.30	41I												
21.00	42I												
21.30	43I												
22.00	44I												
22.30	45I												
23.00	46I												
23.30	47I												
0.	48I												
0.30	49I												
1.00	50I												
1.30	51I												
2.00	52I												
2.30	53I												
3.00	54I												
3.30	55I												
4.00	56I												


4.30 57I
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5.30 59I
6.00 60I
6.30 61I
7.00 62I
7.30 63I
8.00 64I
8.30 650I
9.00 660I
9.30 670 I
10.00 680 I
10.30 690 I
11.00 70.0.I
11.30 71.0 I
12.00 72.0 I
12.30 73.0 I
13.00 74. 0 I
13.30 75. 0 I
14.00 76. 0 I
14.30 77. 0 I
15.00 78. 0 I
15.30 79. 0 I
16.00 80 0 I
16.30 81. 0 I
17.00 82. 0 I
17.30 83. 0 I
18.00 84. 0 I
18.30 85. 0 I
19.00 86. 0 I
19.30 87. 0 I
20.00 88. 0 I
20.30 89. 0 I
21.00 90 0 I
21.30 91. 0 I
22.00 92. 0 I
22.30 93. 0 I
23.00 94. 0 I
23.30 95. 0 I
0. 96. 0 I
0.30 97. 0 I
1.00 98. 0 I
1.30 99. 0 I
2.00100 0 I
2.30101. 0 I
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3.30103. 0 I
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5.00106. 0 I
5.30107. 0 I
6.00108. 0 I
6.30109. 0 I
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8.00112. 0 I
8.30113. 0 I
9.00114. 0 I
9.30115. 0 I
10.00116. 0 I
10.30117. 0 I

```
11.00117.      I  0.
11.30119.     I   0.
12.00120.....I..0.....
12.30121.     I  0 .
13.00122.     I 0  .
13.30123.     I 0  .
14.00124.    I  0  .
14.30125.    I 0   .
15.00126.    I 0   .
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16.30129.    I0    .
17.00130...I.0.....
17.30131.    I 0   .
18.00132.    I 0   .
18.30133.    I0    .
19.00134.    I0    .
19.30135.    I0    .
20.00136.    I0    .
20.30137.    I0    .
21.00138.  I 0     .
21.30139.  I0      .
22.00140..I0.....
22.30141.  I0      .
23.00142.  I0      .
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 0.  144.  I0      .
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 3.00150..I0.....
```

•OVN•

STATION 1, PLAN 1, RATIO 6

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	1.	1.	1.	2.	2.	2.	2.	2.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	2.
2.	2.	2.	2.	2.	2.	3.	3.	5.	4.
4.	5.	6.	6.	7.	7.	8.	8.	8.	8.
8.	8.	7.	7.	7.	7.	7.	6.	6.	6.
6.	6.	6.	8.	11.	16.	23.	33.	45.	58.
74.	91.	109.	129.	174.	237.	319.	429.	597.	812.
1106.	1505.	1958.	2483.	3153.	4207.	5129.	5761.	6089.	6136.
5956.	5627.	5215.	4768.	4322.	3902.	3526.	3194.	2914.	2722.
2541.	2358.	2173.	1996.	1854.	1675.	1523.	1379.	1246.	1131.
1044.	966.	897.	835.	780.	733.	694.	657.	623.	592.
562.	535.	509.	485.	463.	442.	422.	404.	389.	375.
361.	348.	335.	322.	310.	298.	287.	276.	265.	255.
245.	235.	226.	217.	208.	200.	192.	185.	177.	170.

STORAGE

1228.	1228.	1228.	1228.	1229.	1229.	1229.	1229.	1229.	1229.
1229.	1229.	1229.	1229.	1229.	1229.	1229.	1229.	1229.	1229.
1229.	1229.	1229.	1229.	1229.	1229.	1229.	1229.	1229.	1229.
1229.	1229.	1229.	1229.	1229.	1229.	1229.	1229.	1229.	1230.
1230.	1231.	1231.	1231.	1231.	1232.	1232.	1232.	1232.	1232.
1232.	1232.	1232.	1232.	1232.	1231.	1231.	1231.	1231.	1231.
1231.	1231.	1231.	1232.	1234.	1237.	1241.	1246.	1252.	1260.
1269.	1278.	1288.	1300.	1315.	1335.	1357.	1388.	1428.	1480.
1546.	1627.	1721.	1827.	1937.	2034.	2106.	2152.	2175.	2178.
2165.	2142.	2112.	2078.	2043.	2009.	1974.	1941.	1906.	1874.
1839.	1802.	1765.	1730.	1695.	1662.	1630.	1601.	1574.	1551.
1532.	1514.	1499.	1485.	1473.	1462.	1452.	1443.	1435.	1427.
1420.	1413.	1407.	1401.	1396.	1391.	1386.	1382.	1377.	1373.
1369.	1365.	1361.	1359.	1354.	1351.	1347.	1344.	1341.	1338.
1335.	1332.	1329.	1327.	1324.	1322.	1320.	1318.	1315.	1313.

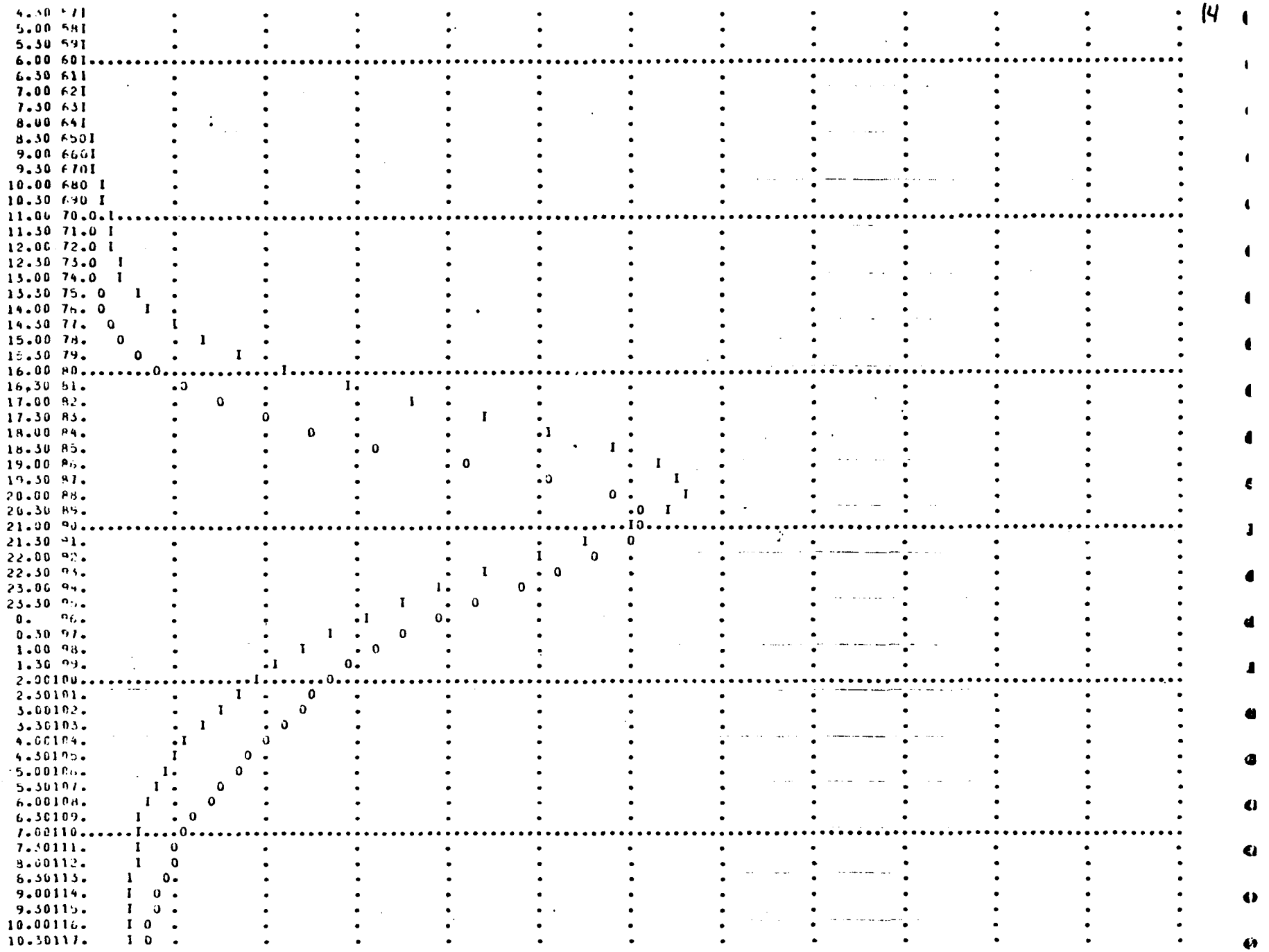
STAGE

533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.0	533.1	533.1	533.1	533.1	533.1	533.1
533.1	533.1	533.1	533.1	533.1	533.1	533.0	533.0	533.0	533.0
533.0	533.0	533.0	533.1	533.1	533.1	533.2	533.2	533.3	533.4
533.5	533.7	533.8	534.0	534.1	534.4	534.7	535.1	535.6	536.2
536.9	537.8	538.8	539.8	540.9	541.8	542.4	542.8	543.0	543.0
542.9	542.7	542.5	542.2	541.9	541.5	541.2	540.9	540.6	540.3
540.0	539.6	539.2	538.9	538.5	538.2	537.8	537.5	537.2	537.0
536.7	536.5	536.4	536.2	536.1	536.0	535.8	535.7	535.6	535.5
535.5	535.4	535.3	535.2	535.2	535.1	535.0	535.0	534.9	534.9
534.8	534.8	534.7	534.7	534.6	534.6	534.6	534.5	534.5	534.4
534.4	534.4	534.3	534.3	534.3	534.2	534.2	534.2	534.2	534.1

PEAK OUTFLOW IS 6136. AT TIME 45.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6136.	5038.	2286.	822.	118380.

CMS	174.	144.	65.	25.	5502.
INCHES		7.33	13.31	14.36	14.56
MM		186.27	338.18	364.75	369.77
AC-FT		2498.	4535.	4891.	4892.
THOUS CU M		3081.	5594.	6034.	6034.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6.00 60I
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7.00 62I
7.50 63I
8.00 64I
8.50 65OI
9.00 66OI
9.50 67OI
10.00 680 I
10.50 690 I
11.00 70.0.I
11.50 71.0 I
12.00 72.0 I
12.50 73.0 I
13.00 74.0 I
13.50 75. 0 I
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14.50 77. 0 I
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16.50 81. .0 . I.
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0. 96. . I . 0
0.50 97. . I . 0
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1.50 99. . I . 0
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10.50117. I 0

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FORMULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 0.50	RATIO 2 0.54	RATIO 3 0.55	RATIO 4 0.67	RATIO 5 0.68	RATIO 6 1.00
HYDROGRAPH AT	1	6.39	1	3290.	3553.	3619.	4408.	4474.	6580.
		(15891.55)		(93.16)(	100.61)(	102.47)(	124.83)(	126.69)(	186.31)(
ROUTED TO	1	6.39	1	2606.	2821.	2888.	3797.	3869.	6136.
		(15891.55)		(73.78)(	79.90)(	81.77)(	107.52)(	109.57)(	173.75)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	533.00	533.00	540.50
STORAGE	1228.	1228.	1895.
OUTFLOW	0.	0.	2827.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.50	540.08	0.	1852.	2606.	0.	46.00	0.
0.54	540.49	0.	1894.	2821.	0.	46.00	0.
0.55	540.59	0.09	1905.	2888.	1.00	45.50	0.
0.67	541.47	0.97	1999.	3797.	4.00	45.50	0.
0.68	541.52	1.02	2006.	3869.	4.50	45.50	0.
1.00	543.04	2.54	2178.	6136.	7.50	45.00	0.

APPENDIX D

STABILITY COMPUTATIONS

MEAD RESERVOIR DAM

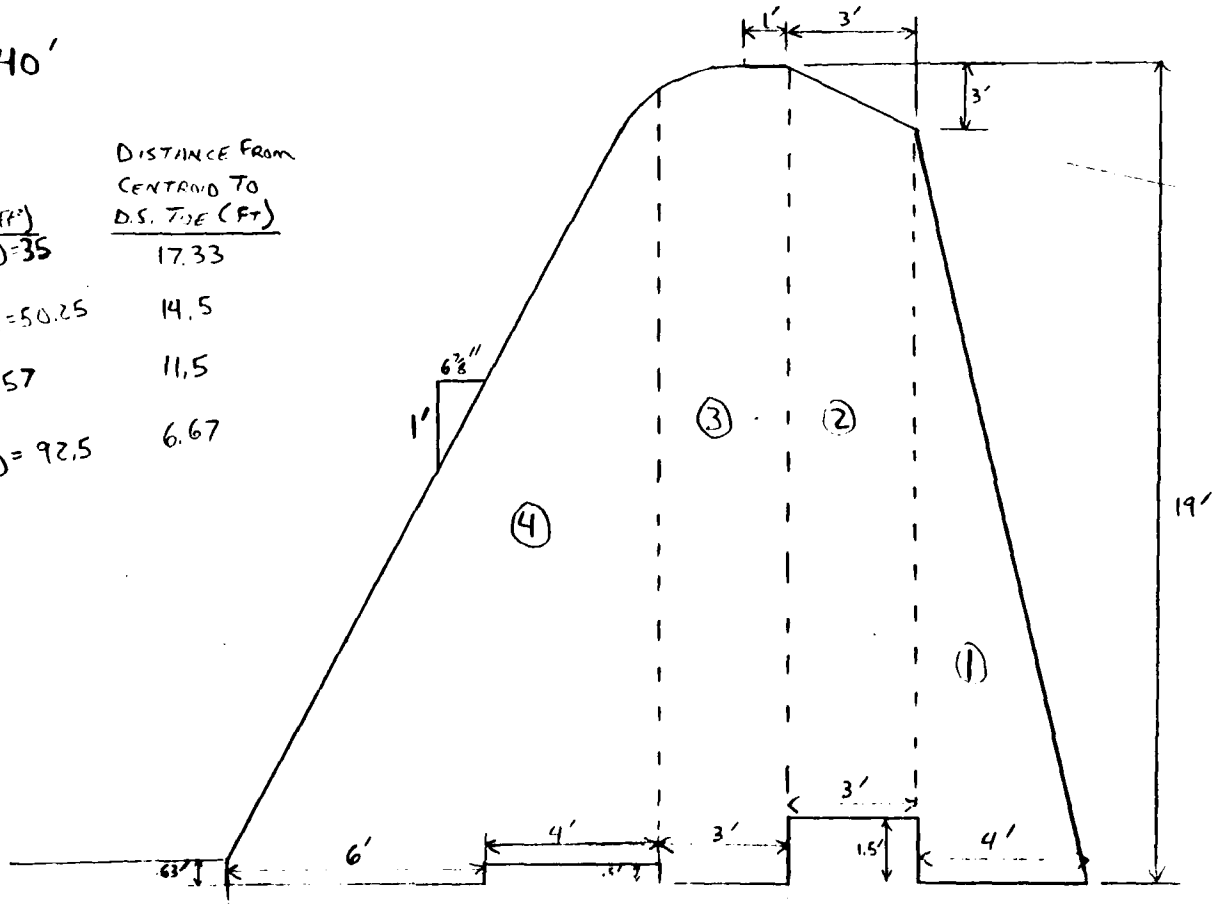
I.D. NO. 237

CROSS SECTION OF SPILLWAY

GRAVITY SECTION

SCALE 1" = 40'

SEGMENT	AREA (FT²)	DISTANCE FROM CENTROID TO D.S. TOE (FT)
①	$\frac{1}{2}(4)(17.5) = 35$	17.33
②	$(3)(16.75) = 50.25$	14.5
③	$(3)(19) = 57$	11.5
④	$\frac{1}{2}(10)(18.5) = 92.5$	6.67



STRUCTURAL STABILITY ANALYSIS

This analysis was based on a cross section of the spillway segment shown on the plans. A normal analysis was performed including both overturning and sliding analysis. Since the foundation conditions and the effectiveness of the cutoff wall was unknown, full uplift was assumed at the upstream toe, decreasing to the tailwater pressure at the downstream toe.

ANALYSIS CONDITIONS

1. Normal conditions; water surface at spillway crest
2. Same as #1 plus ice load of 5,000 pounds per linear foot.
3. 1/2 PMF; water surface 7.1 feet over the spillway crest
4. Flood flows; water surface 7.5 feet over the spillway crest (at top of relief weir embankment segment)
5. Seismic conditions - water at spillway crest with seismic coefficient of 0.1.

STABILITY ANALYSIS PROGRAM - WORK SHEET

INPUT ENTRY		ANALYSIS CONDITION 1	2	3	4	5
Unit Weight of Dam (K/ft^3)	0	0.15	0.15	0.15	0.15	0.15
Area of Segment No. 1 (ft^2)	1	35	35	35	35	35
Distance from Center of Gravity of Segment No. 1 to Downstream Toe (ft)	2	17.33	17.33	17.33	17.33	17.33
Area of Segment No. 2 (ft^2)	3	50.25	50.25	50.25	50.25	50.25
Distance from Center of Gravity of Segment No. 2 to Downstream Toe (ft)	4	14.5	-5	14.5	14.5	14.5
Area of Segment No. 3 (ft^2)	5	57	57	57	57	57
Distance from Center of Gravity of Segment No. 3 to Downstream Toe (ft)	6	11.5	11.5	11.5	11.5	11.5
Base Width of Dam (Total) (ft)	7	20	20	20	20	20
Height of Dam (ft)	8	19	19	19	19	19
Ice Loading (K/L ft.)	9	—	5.0	—	—	—
Coefficient of Sliding	10	0.65	0.65	0.65	0.65	0.65
Unit Weight of Soil (K/ft^3) (deduct 10)	11	0.055	0.055	0.055	.055	.055
Active Soil Coefficient - Ka	12	0.24	0.24	0.24	0.24	0.24
Passive Soil Coefficient - Kp	13	4.11	4.11	4.11	4.11	4.11
Height of Water over Top of Dam or Spillway (ft)	14	—	—	7.1	7.5	—
Height of Soil for Active Pressure (ft)	15	16	16	16	16	16
Height of Soil for Passive Pressure (ft)	16	0.63	0.63	0.63	0.63	0.63
Height of Water in Tailrace Channel (ft)	17	2	2	5	5	2
Weight of Water (K/ft^3)	18	0.0624	0.0624	.0624	.0624	0.0624
Area of Segment No. 4 (ft^2)	19	92.5	92.5	92.5	92.5	92.5
Distance from Center of Gravity of Segment No. 4 to Downstream Toe (ft)	20	6.67	6.67	6.67	6.67	6.67
Height of Ice Load or Active Water (ft) (does not include 14)	46	19	19	19	19	19
Seismic Coefficient (g)	50	—	—	—	—	0.1

RESULTS OF ANALYSIS

Factor of Safety vs. Overturning	1.58	1.14	1.16	1.14	1.52
Distance From Toe to Resultant	6.53	3.24	2.63	2.41	6.09
Factor of Safety vs. Sliding	1.12	0.81	0.65	0.64	0.82

APPENDIX E

REFERENCES

APPENDIX E

REFERENCES

1) U.S. Department of Commerce; Weather Bureau; Hydrometeorological Report No. 33 - Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24, and 48 Hours, April 1956.

2) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.

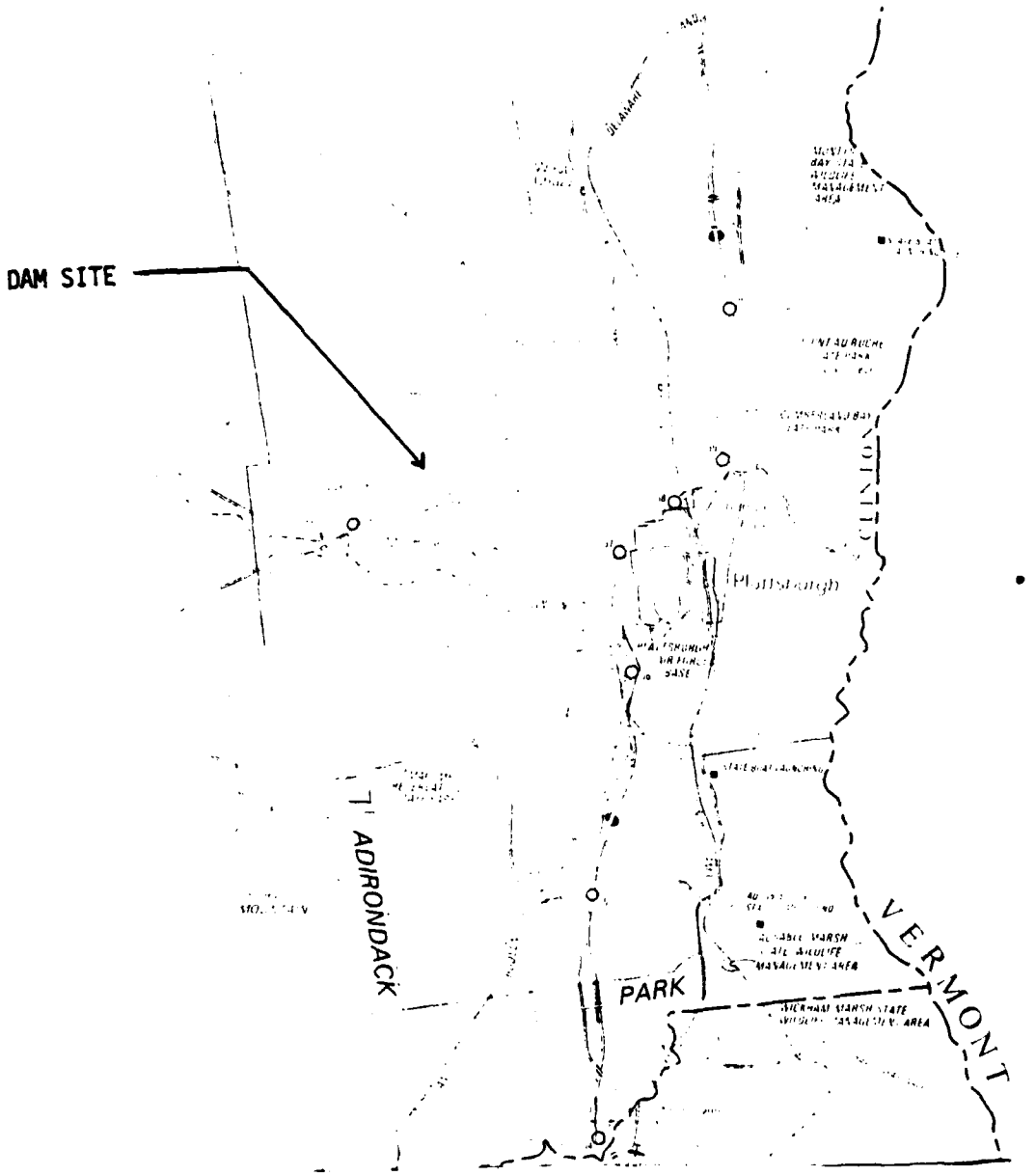
3) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960.

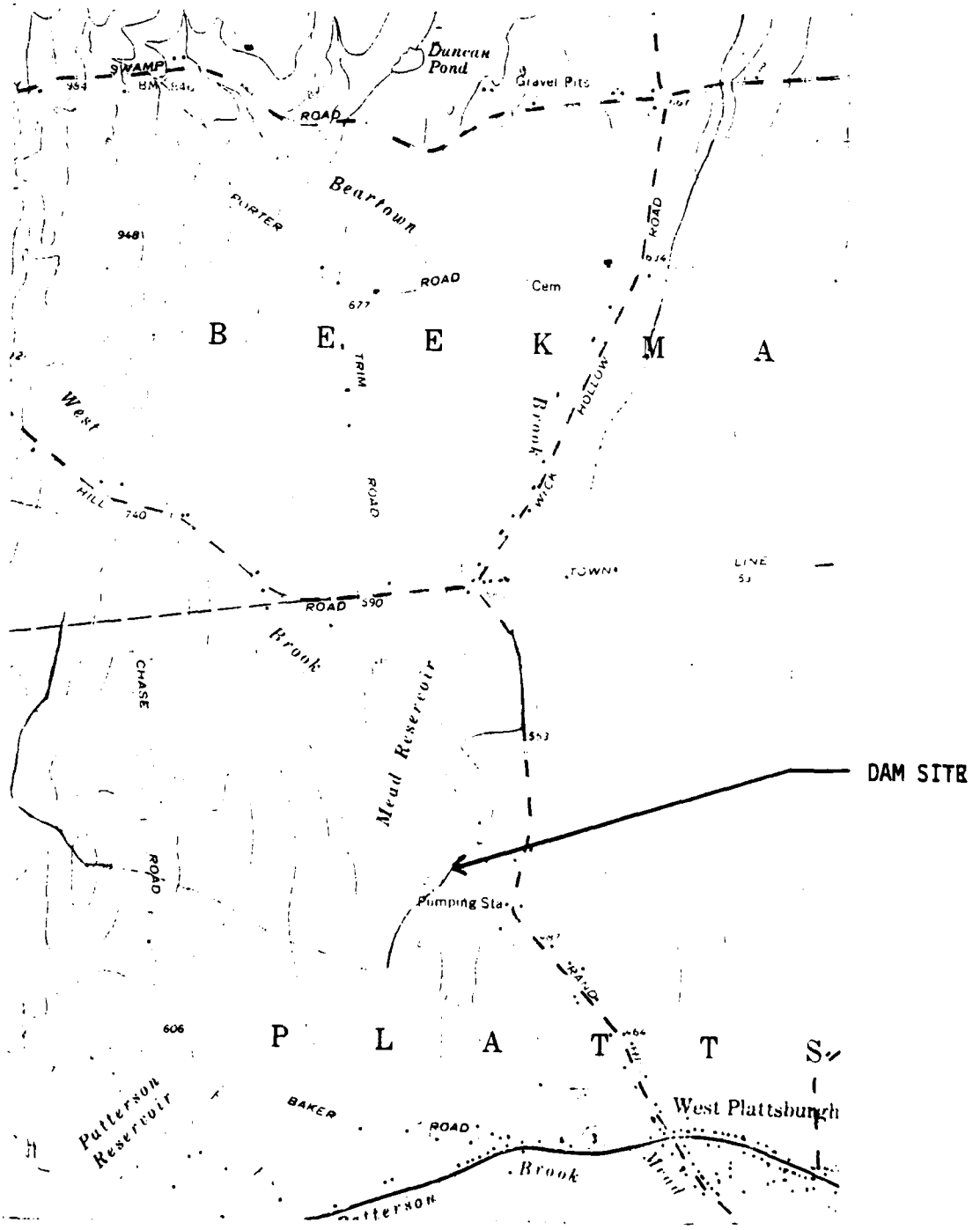
5) U.S. Department of the Interior, Bureau of Reclamations; Design of Small Dams, 2nd edition (rev. reprint), 1977.

APPENDIX F

DRAWINGS

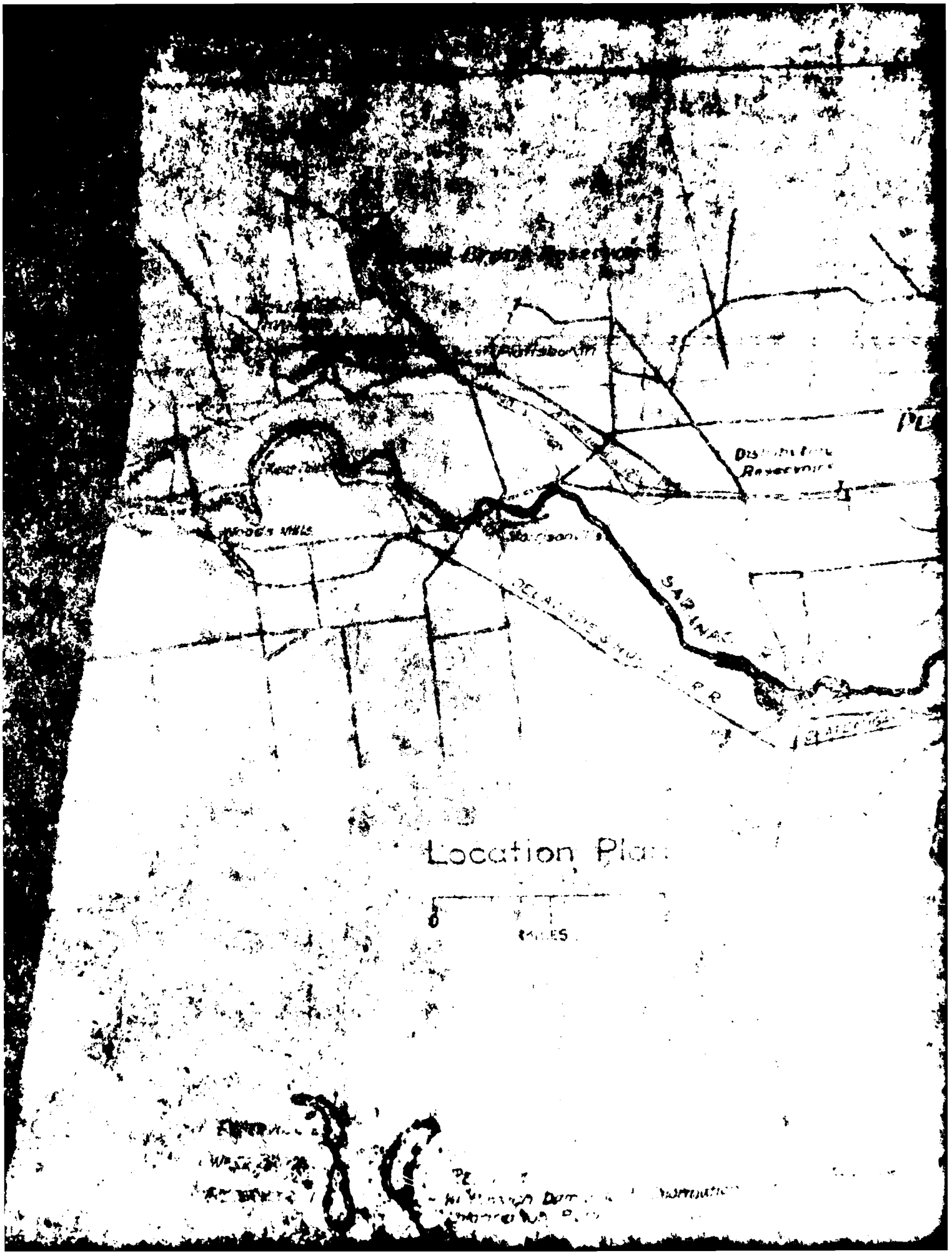


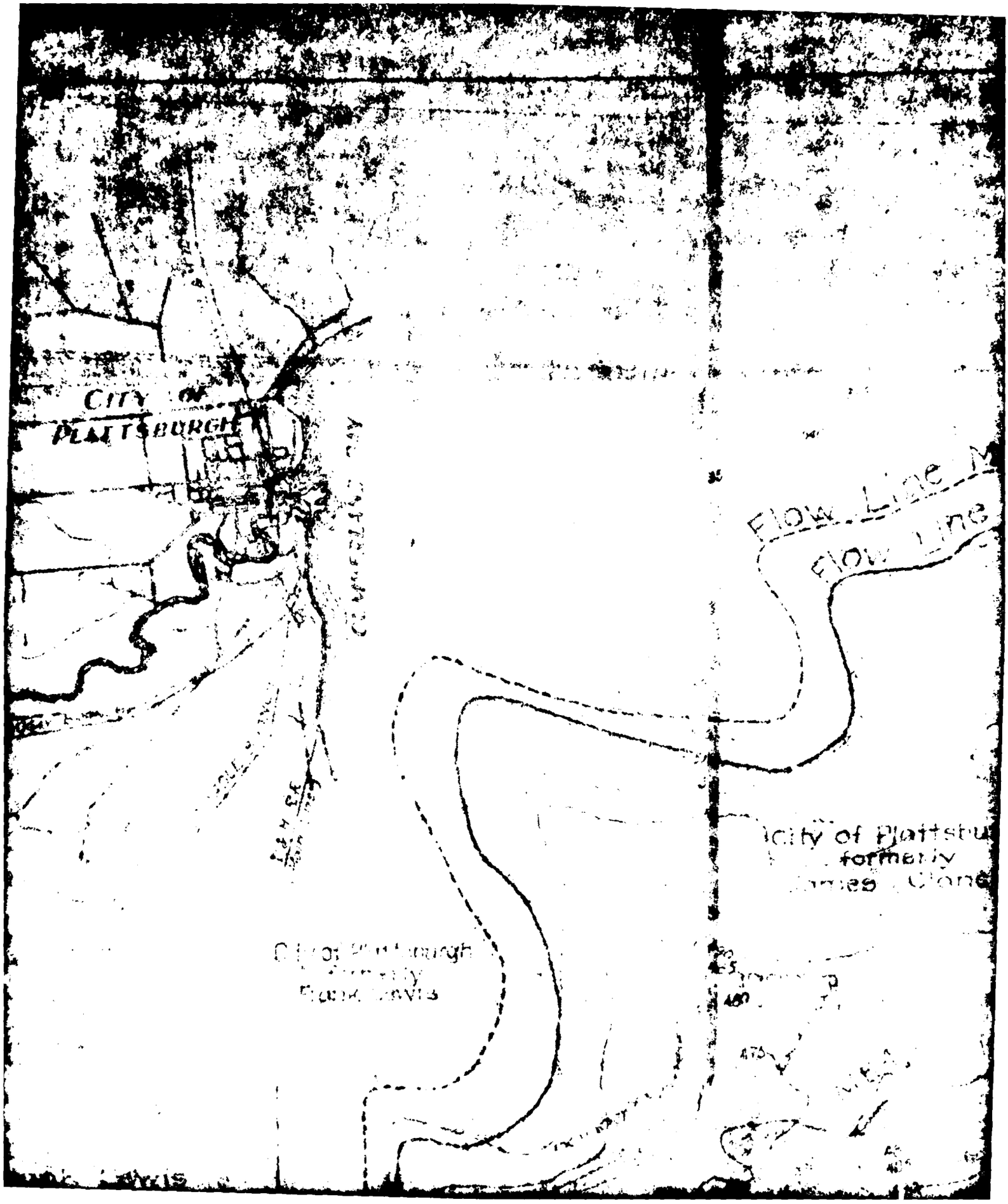
VICINITY MAP
M&AD RESERVOIR DAM
I.D. NO. NY237

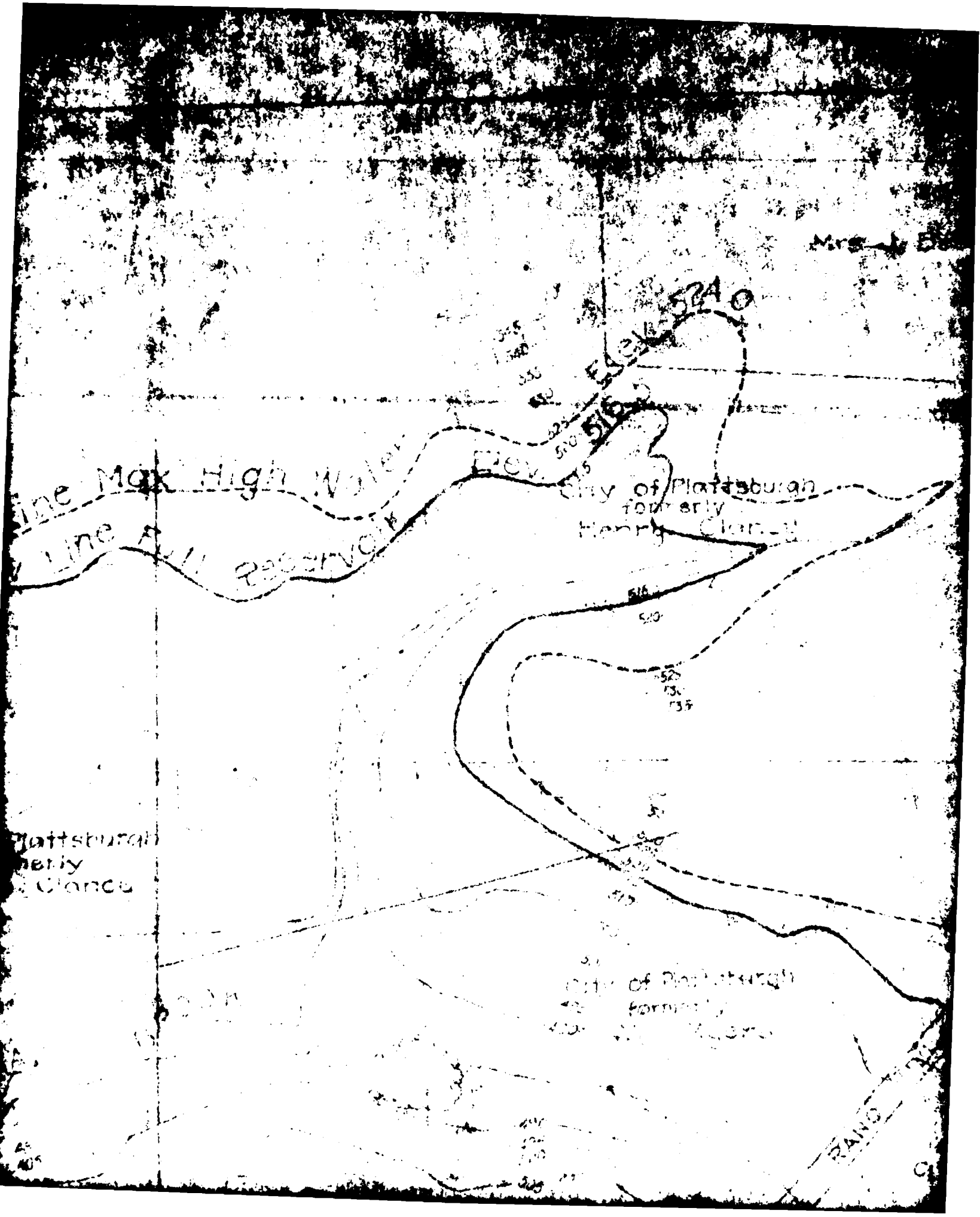


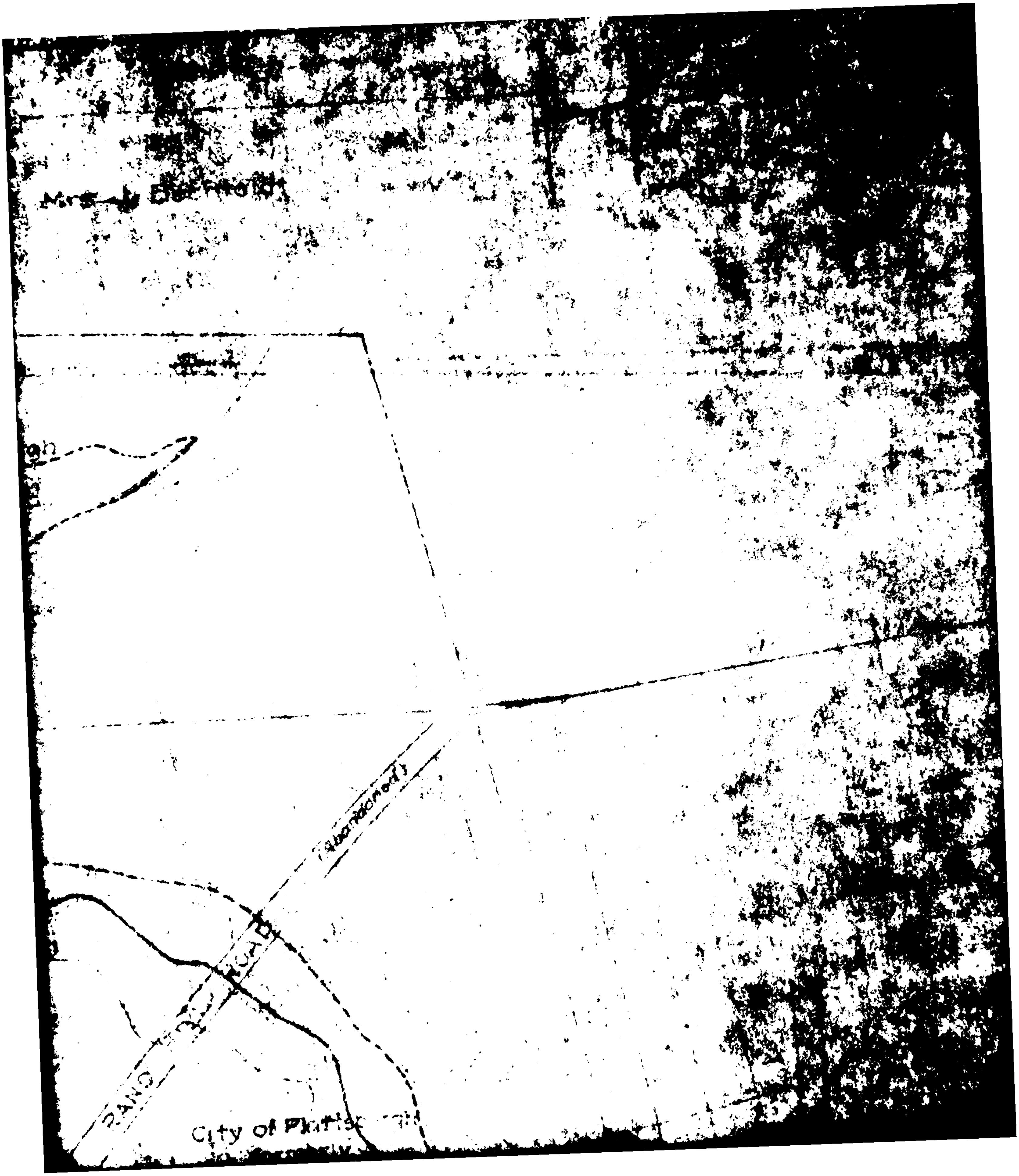
TOPOGRAPHIC MAP
MEAD RESERVOIR DAM

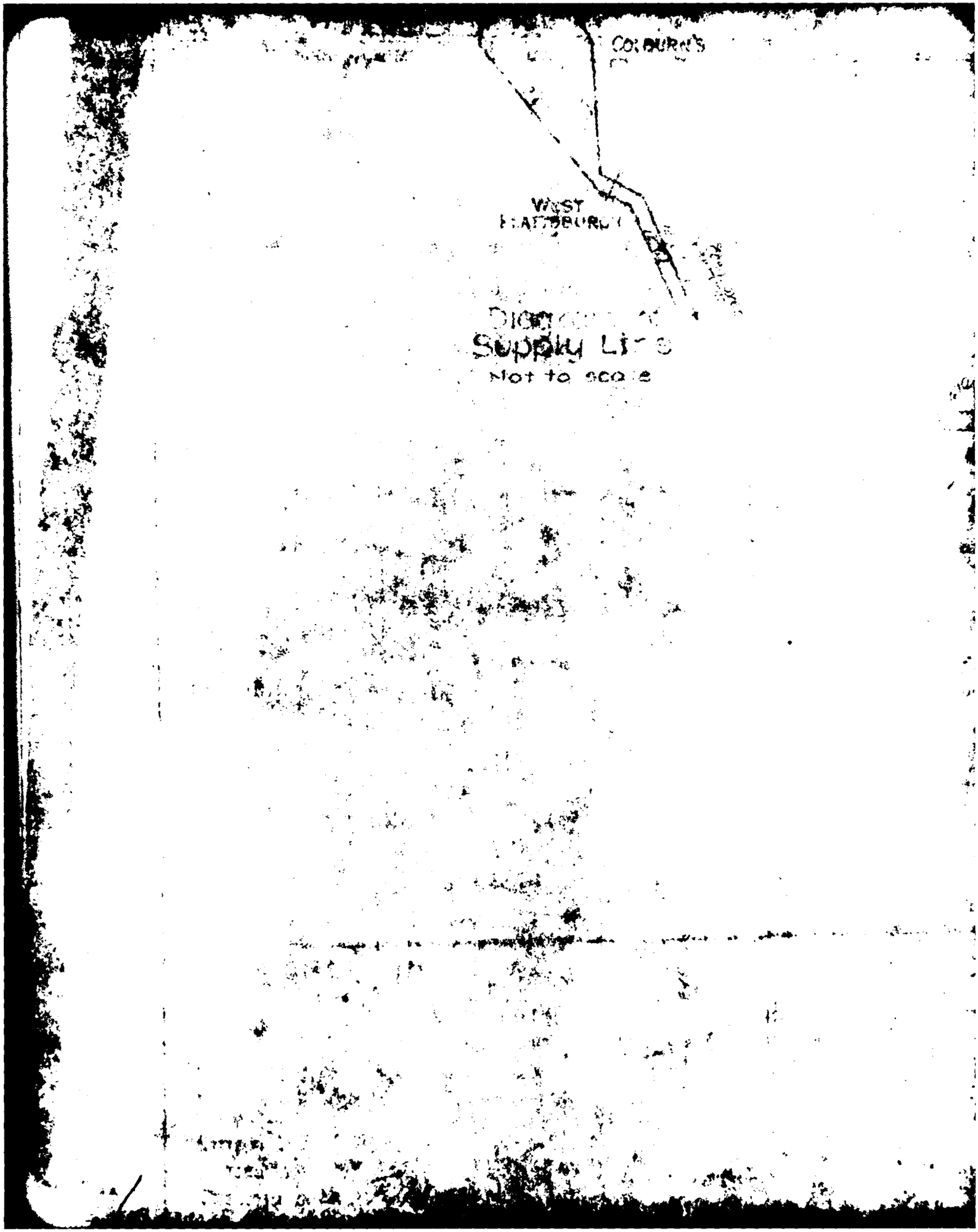
I.D. NO. NY 237

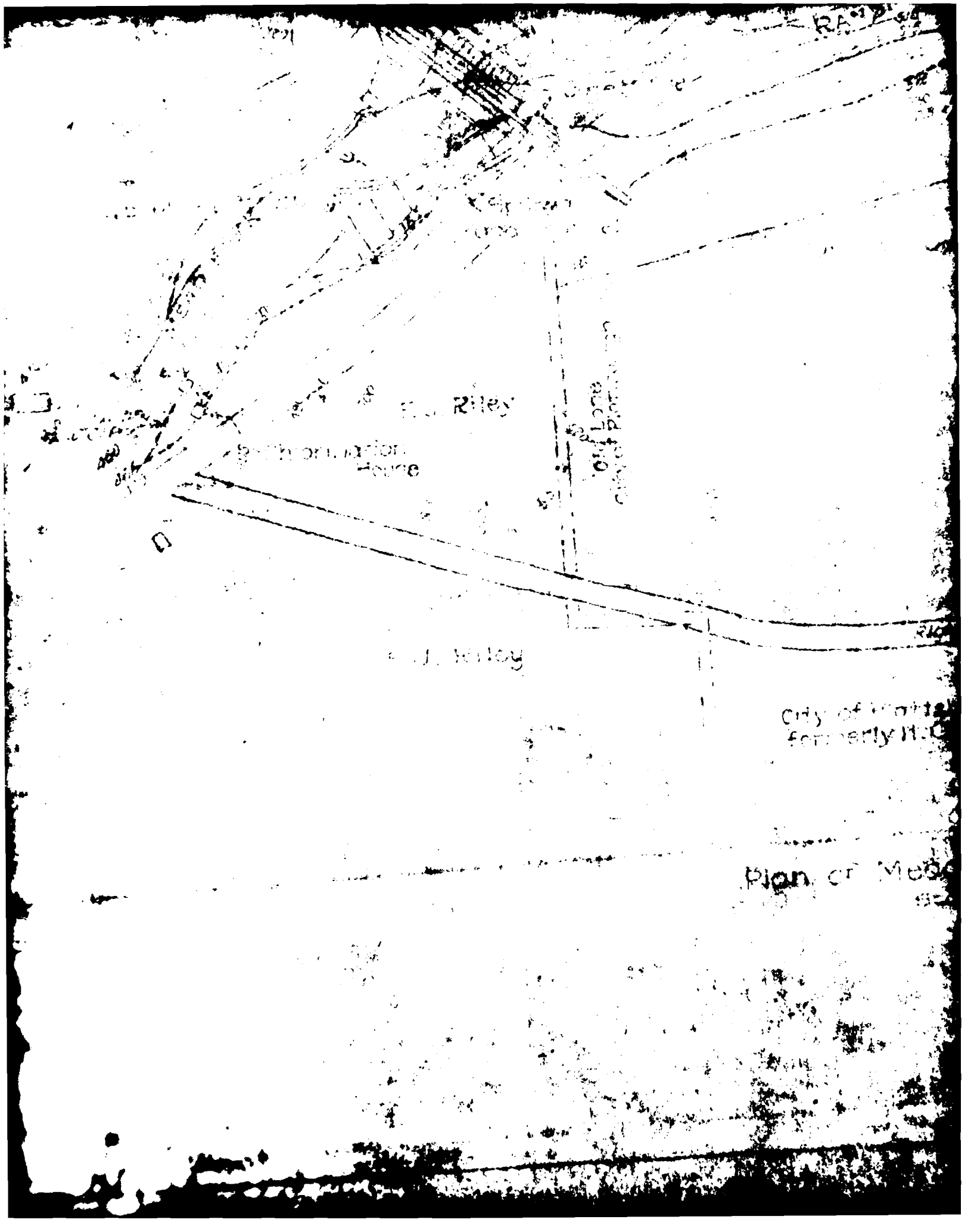

Location Plan
0
MILES

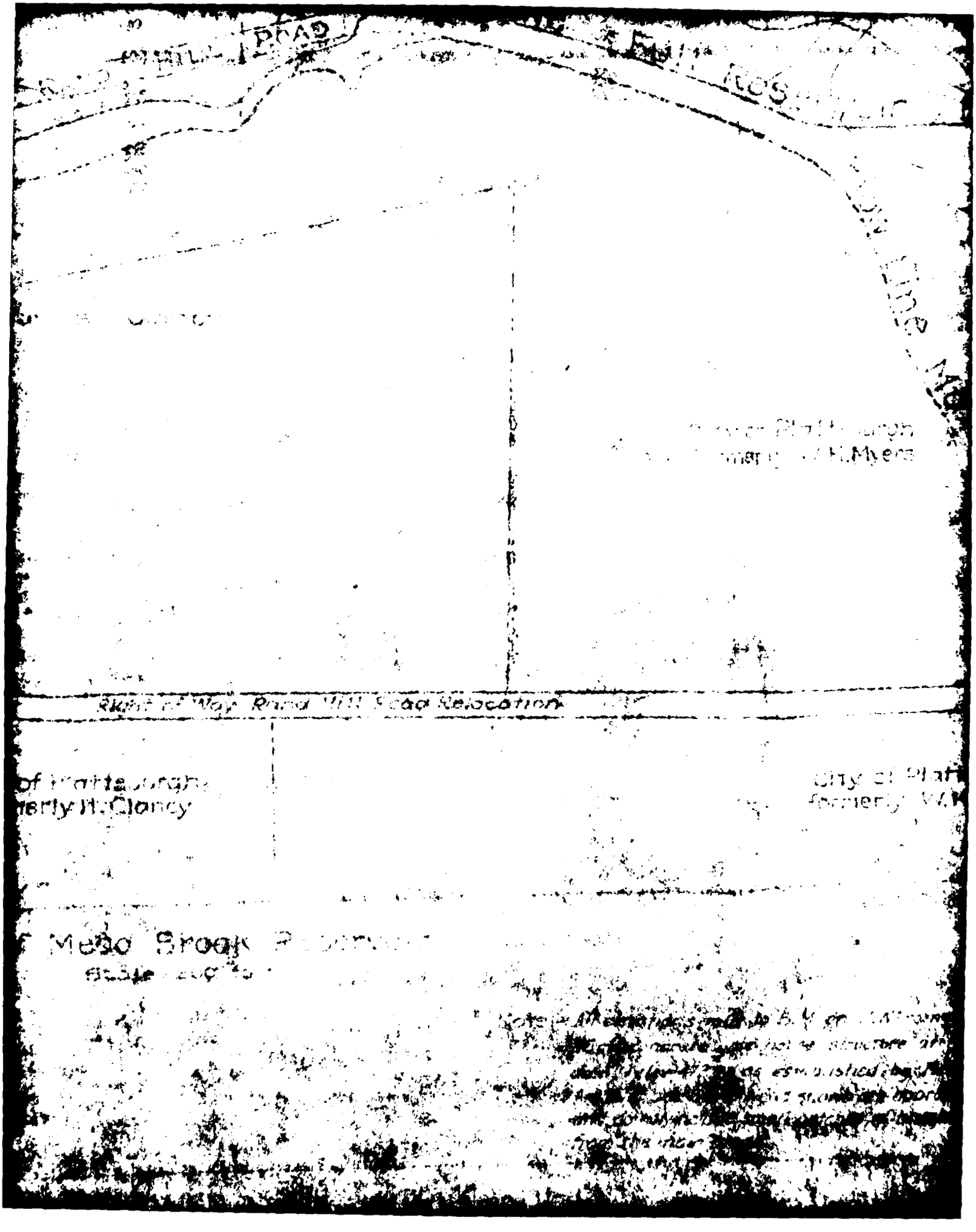

CITY OF
PLATTSBURGH
CUMBERLAND BAY
FLOW LINE
FLOW LINE
City of Plattsburgh
formerly

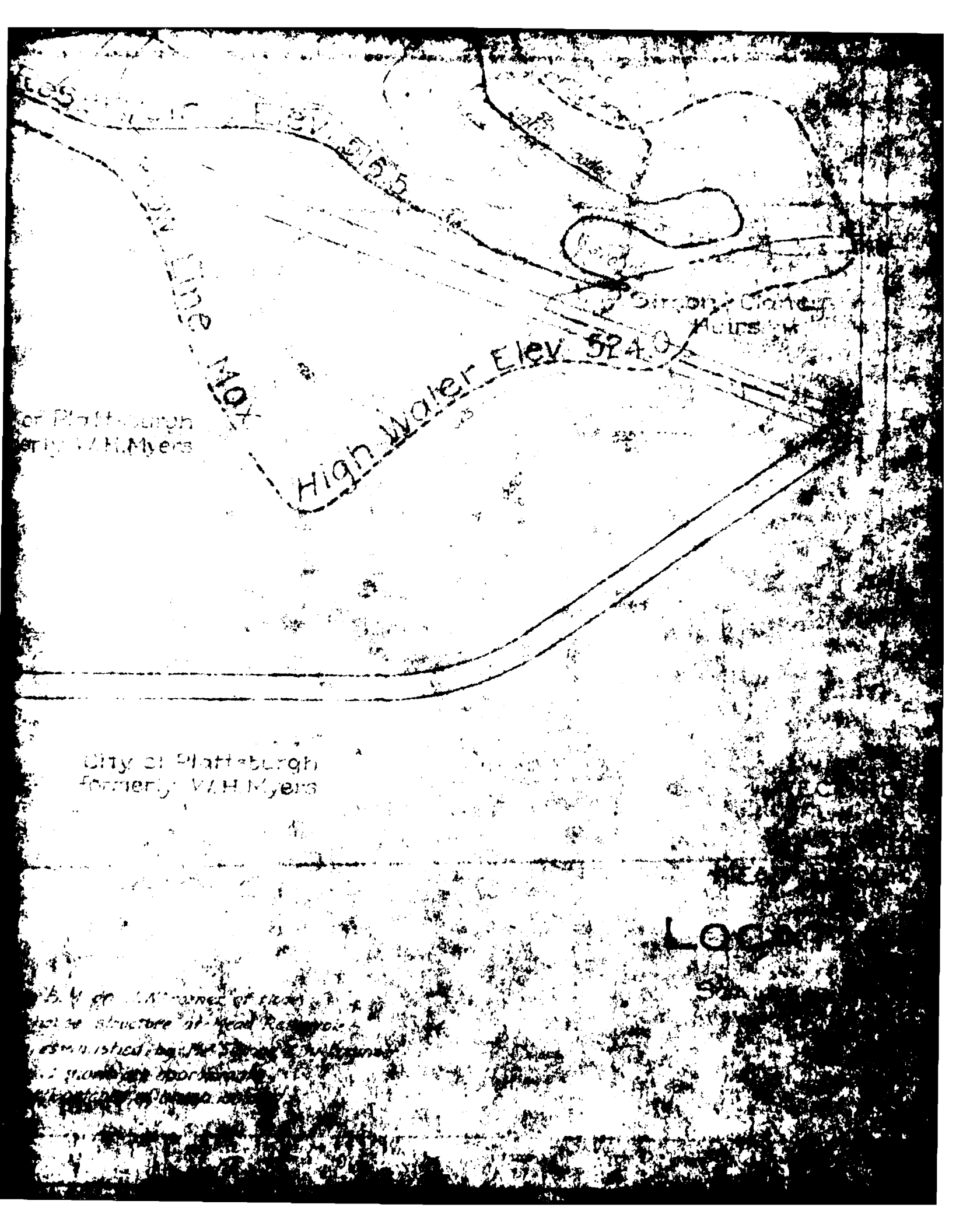

524.0
516
Line Max High Water
City of Plattsburgh
formerly
Henry Clark
Line Full Reservoir
520
525
530
535
Plattsburgh
merly
Clarke
City of Plattsburgh
formerly
RANGE


(Abandoned)


COLBURN'S
WEST
Supply Lines
Not to scale


RA
Riley
House
Riley
Plan of


Right of Way Road Widening & Road Relocation
Mebo Brook

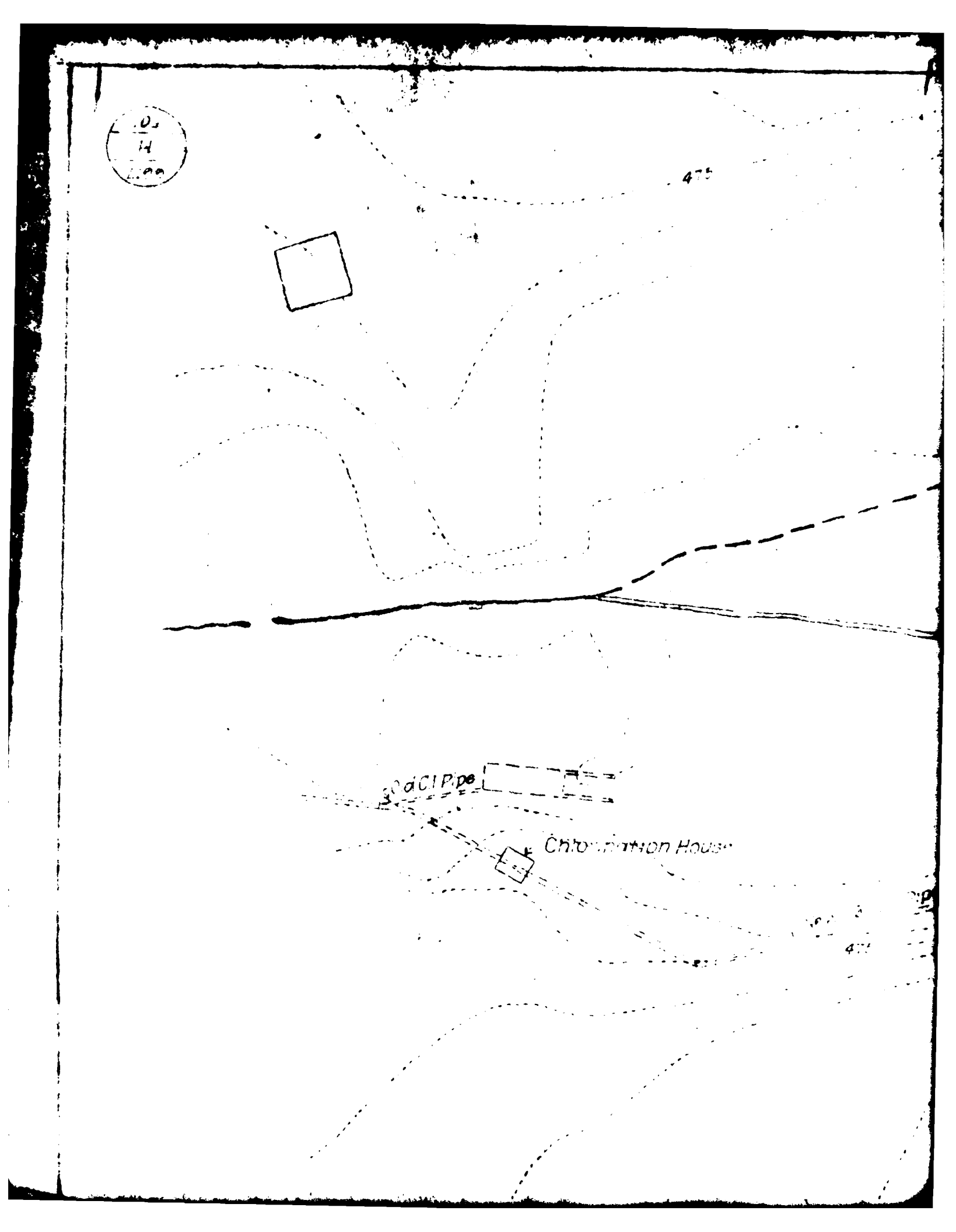

High Water Elev. 524.0
City of Plattsburgh
formerly W.H.Myers

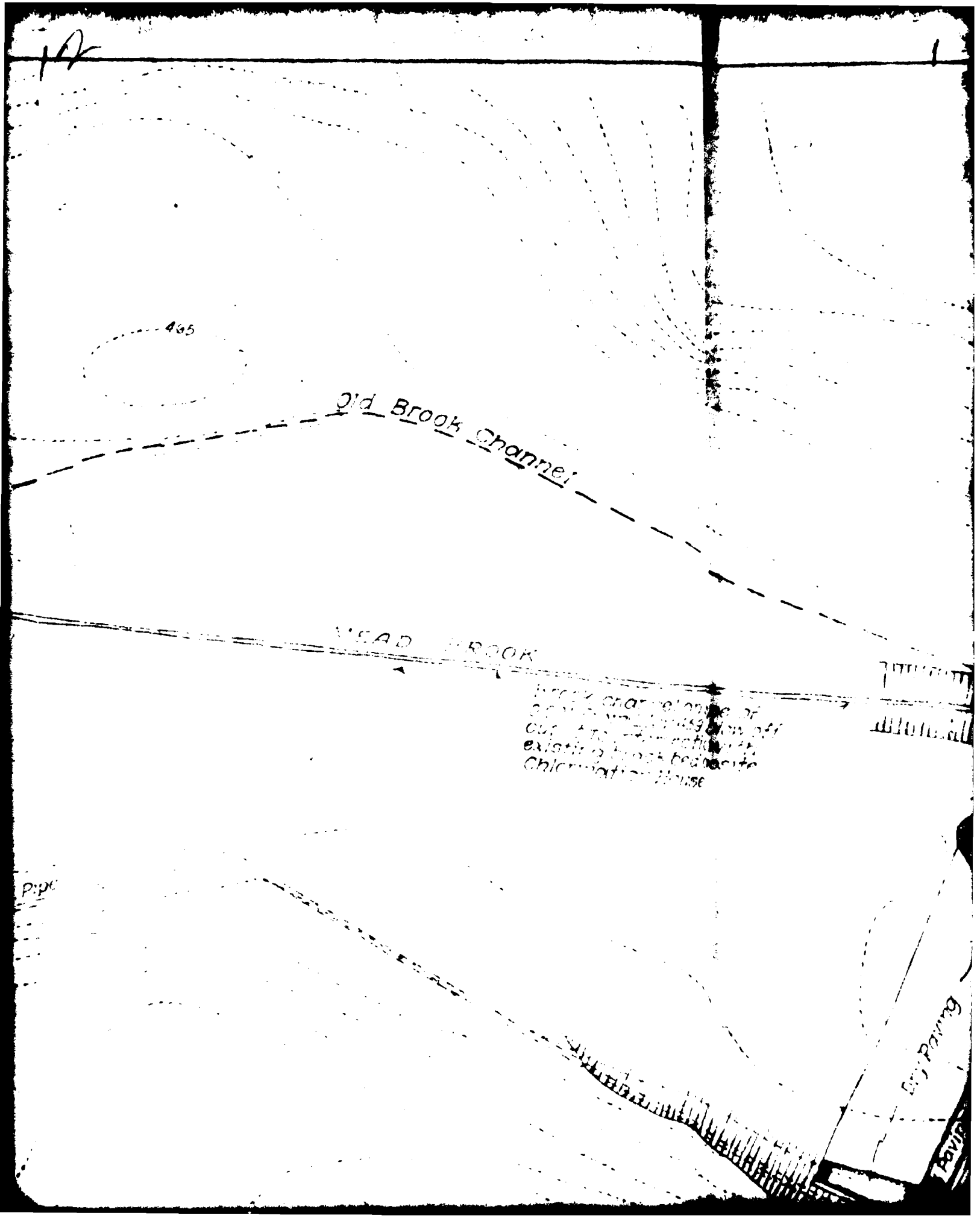
RECORD PLA

MEAD BROOK

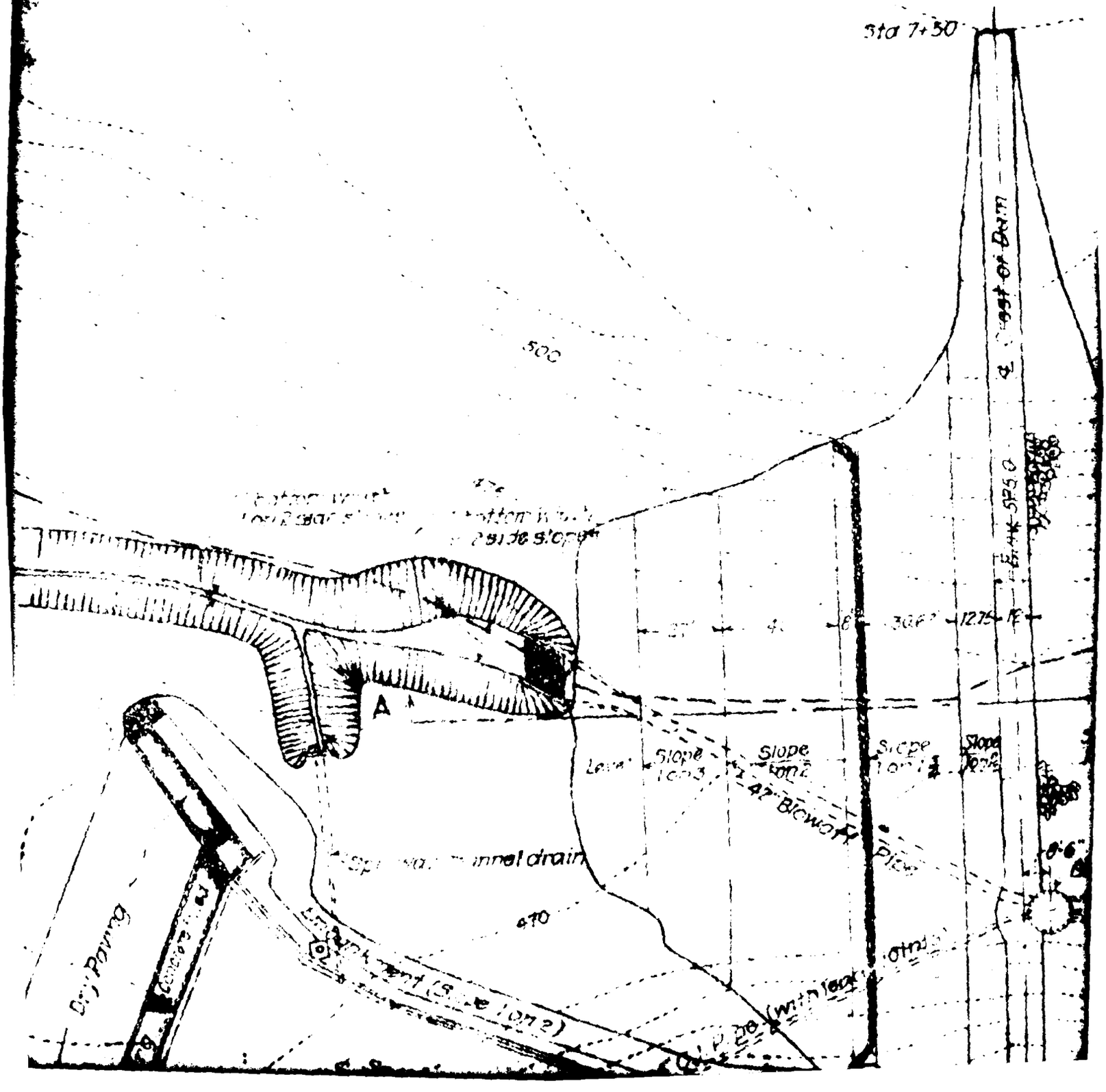
LOCAT

SA

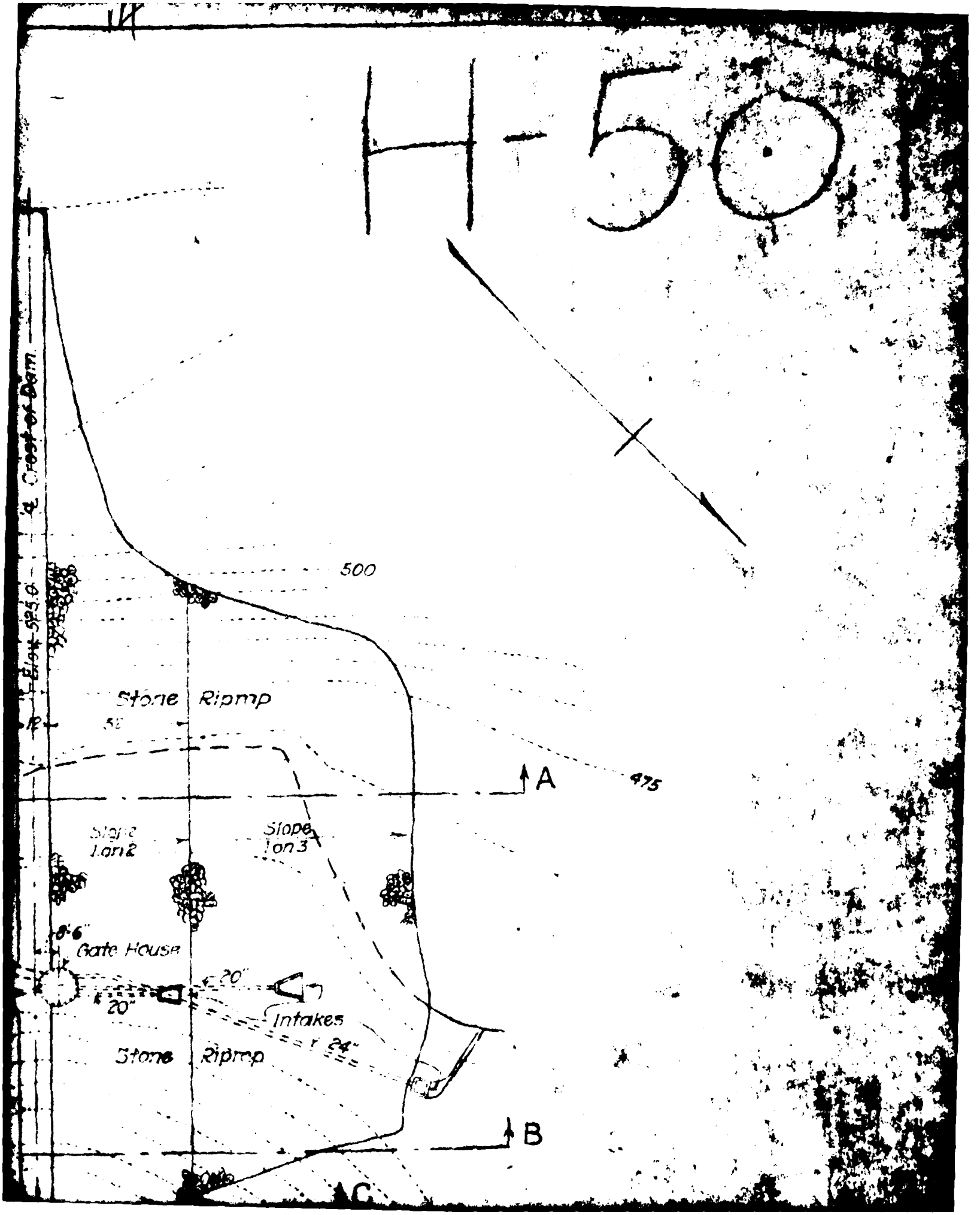

dCI Pipe
Chlorination House

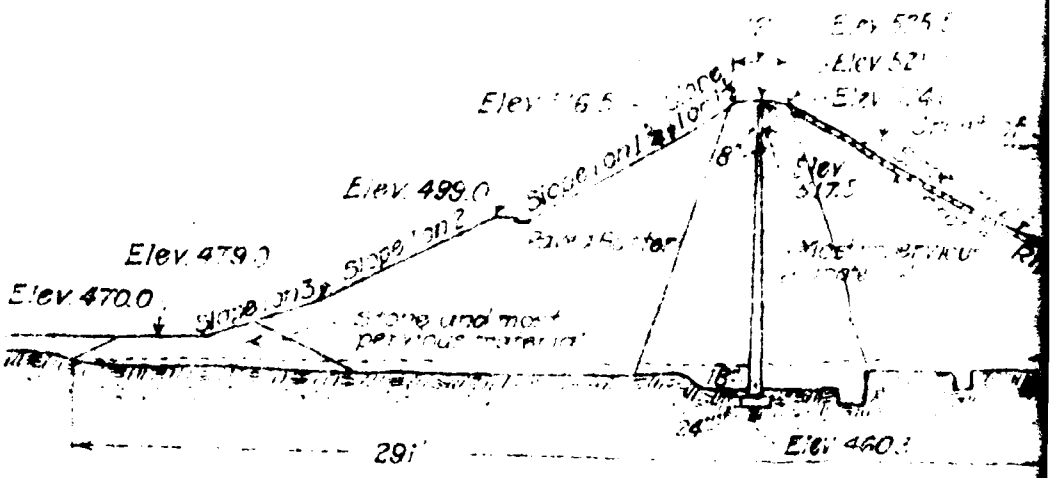

465
Old Brook Channel
MEAD BROOK

13



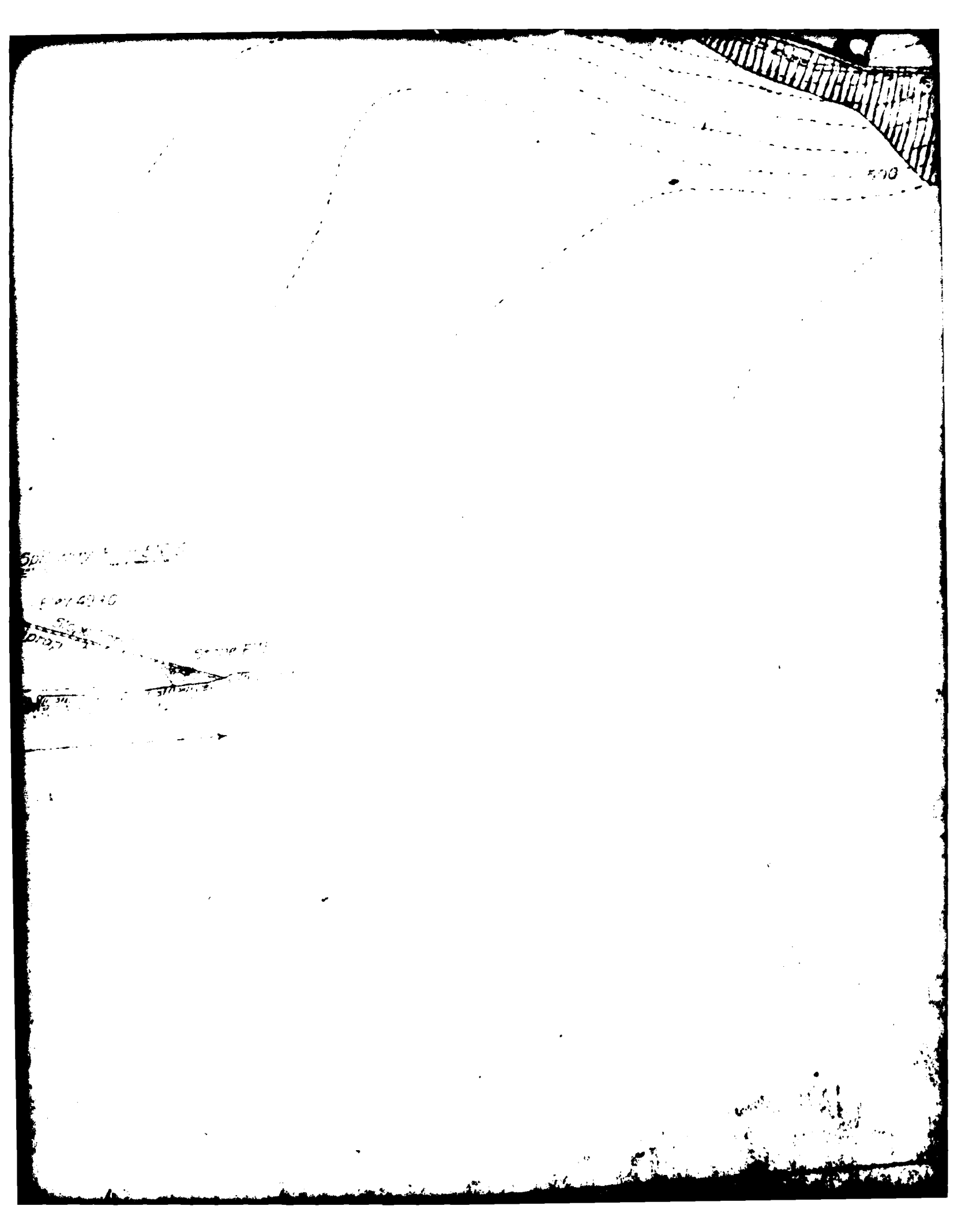
H-501

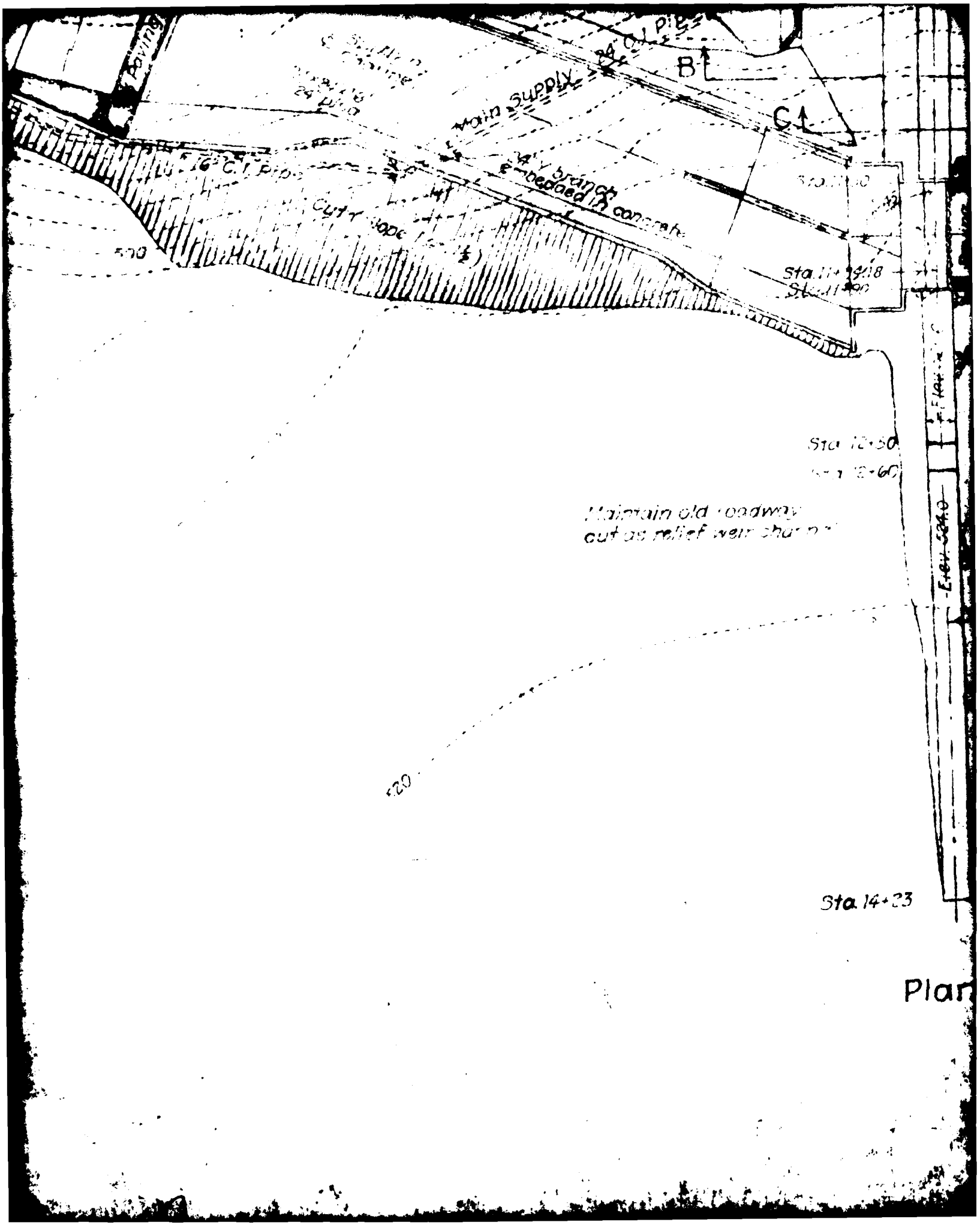

El. 525.0 ± Crest of Dam
500
Stone Riprap
A
475
Slope 1 on 2
Slope 1 on 3
8'6"
Gate House
20'
20'
Intakes
24"
Stone Riprap
B
C

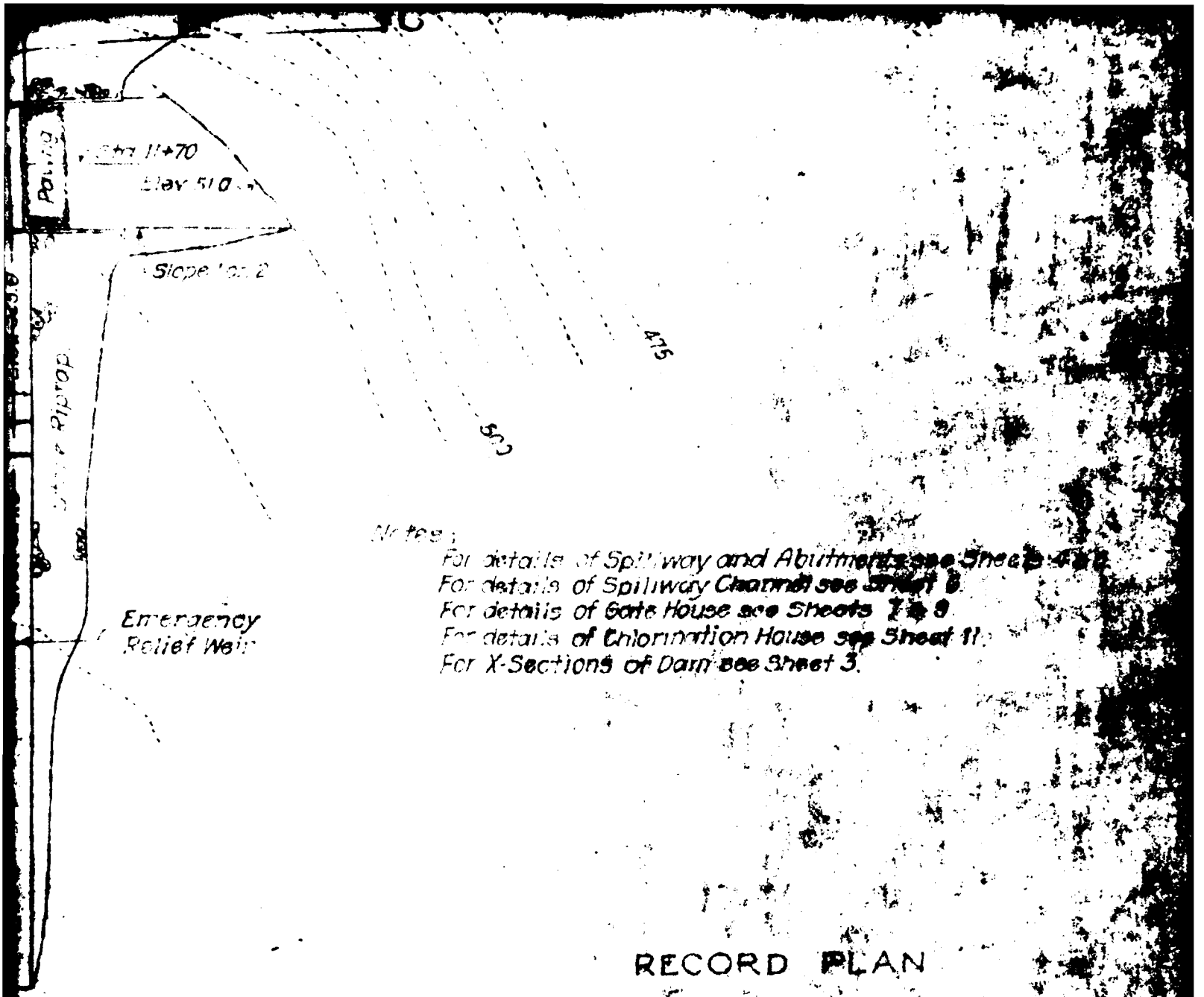


Section A-A

Drawn by C.E.C.
Traced by E.S.B.
Checked by




Paving
Main supply
B
C
Sta 12+50
Sta 14+23
Plan



Notes:

For details of Spillway and Abutments see Sheets 4 & 5.
For details of Spillway Channel see Sheet 6.
For details of Gate House see Sheets 7 & 8.
For details of Chlorination House see Sheet 11.
For X-Sections of Dam see Sheet 3.

RECORD PLAN

PLATTSBURGH, N.Y.

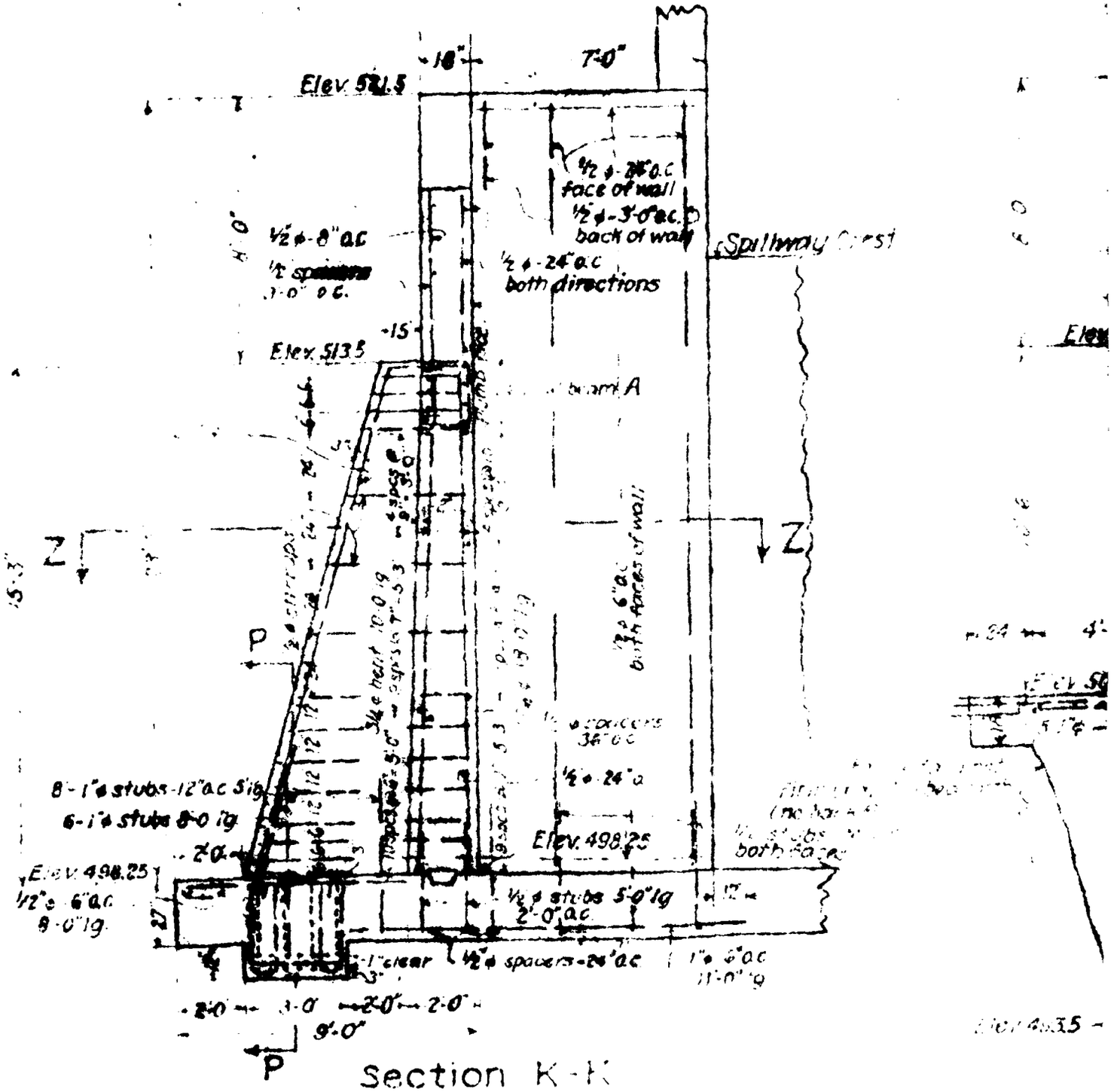
MEAD BROOK RESERVOIR

PLAN OF DAM

SCALE 1-40' TO 1" NOV., 1932

Metcalf & Eddy
Consulting Engineers
Boston, Mass.

18

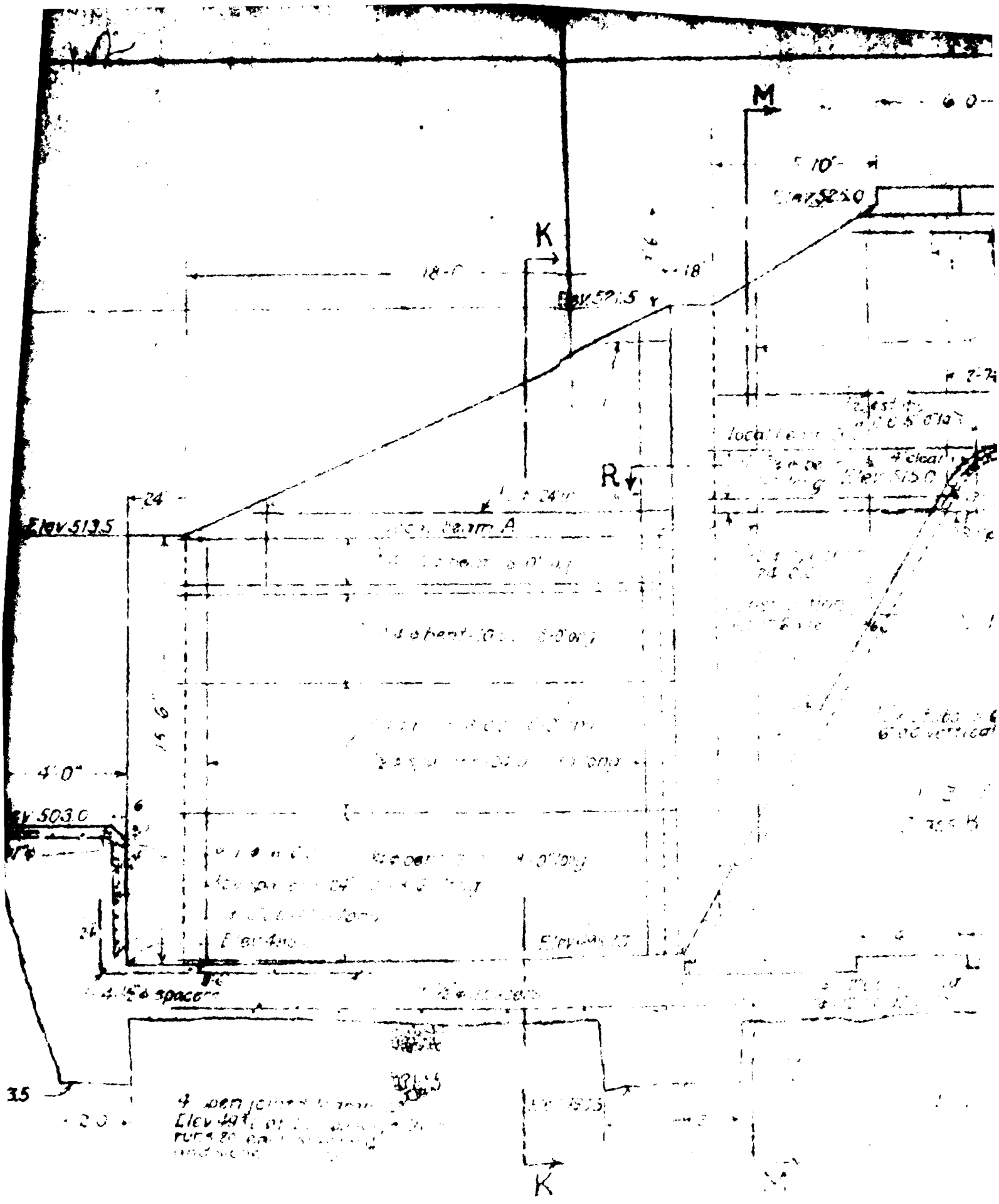


Section K-K

21'-6"

9'-5"

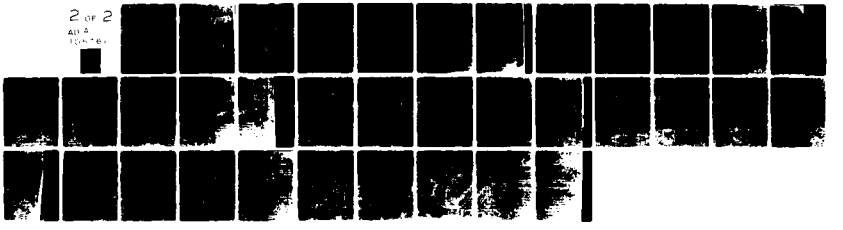
4-½ ϕ 18'-0" lg

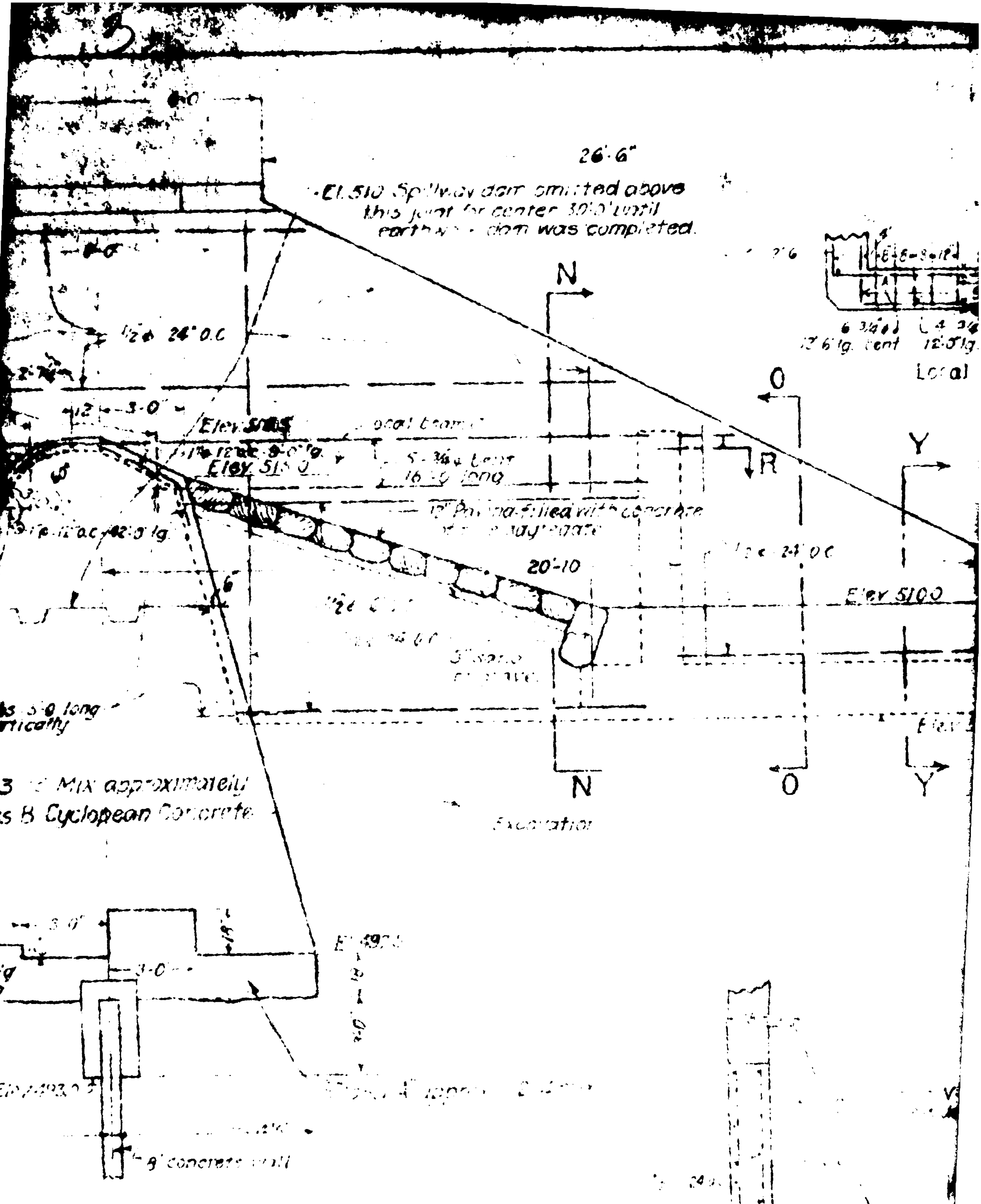

M
K
R
K
18'-0"
18"
24"
4'-0"
4 spaces

AD-A105 761 NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. MEAD RESERVOIR DAM (INVENTORY NUMB--ETC(U)
AUG 81 G KOCH DACW51-79-C-0001

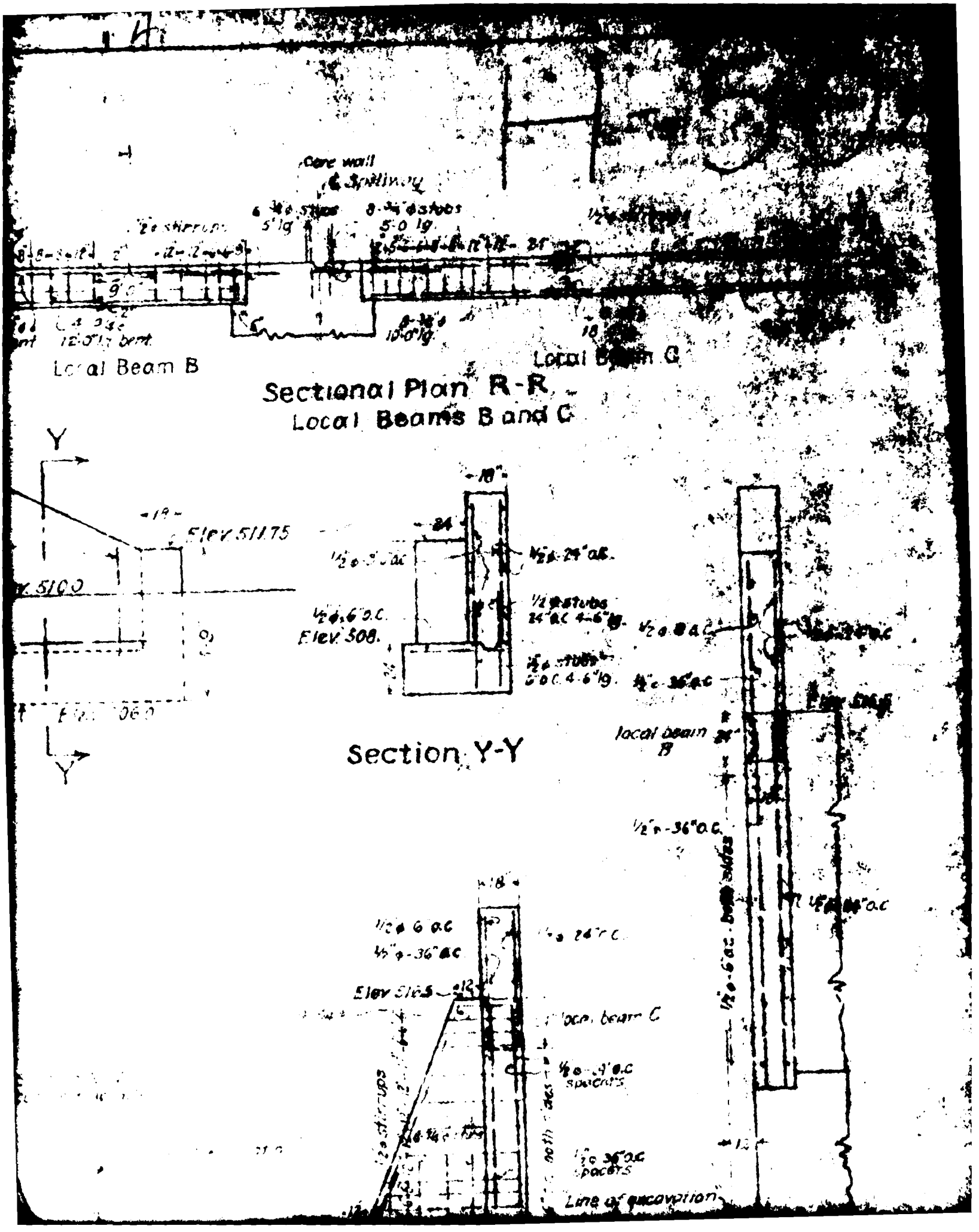
UNCLASSIFIED NL

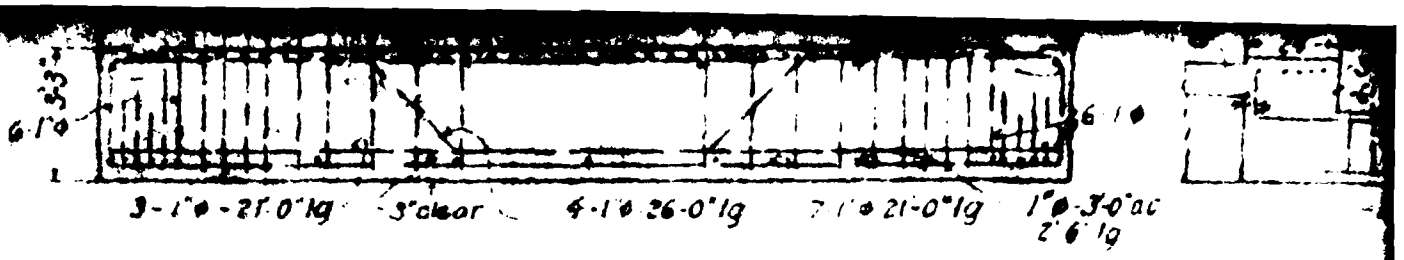
2 OF 2
AD A
105761



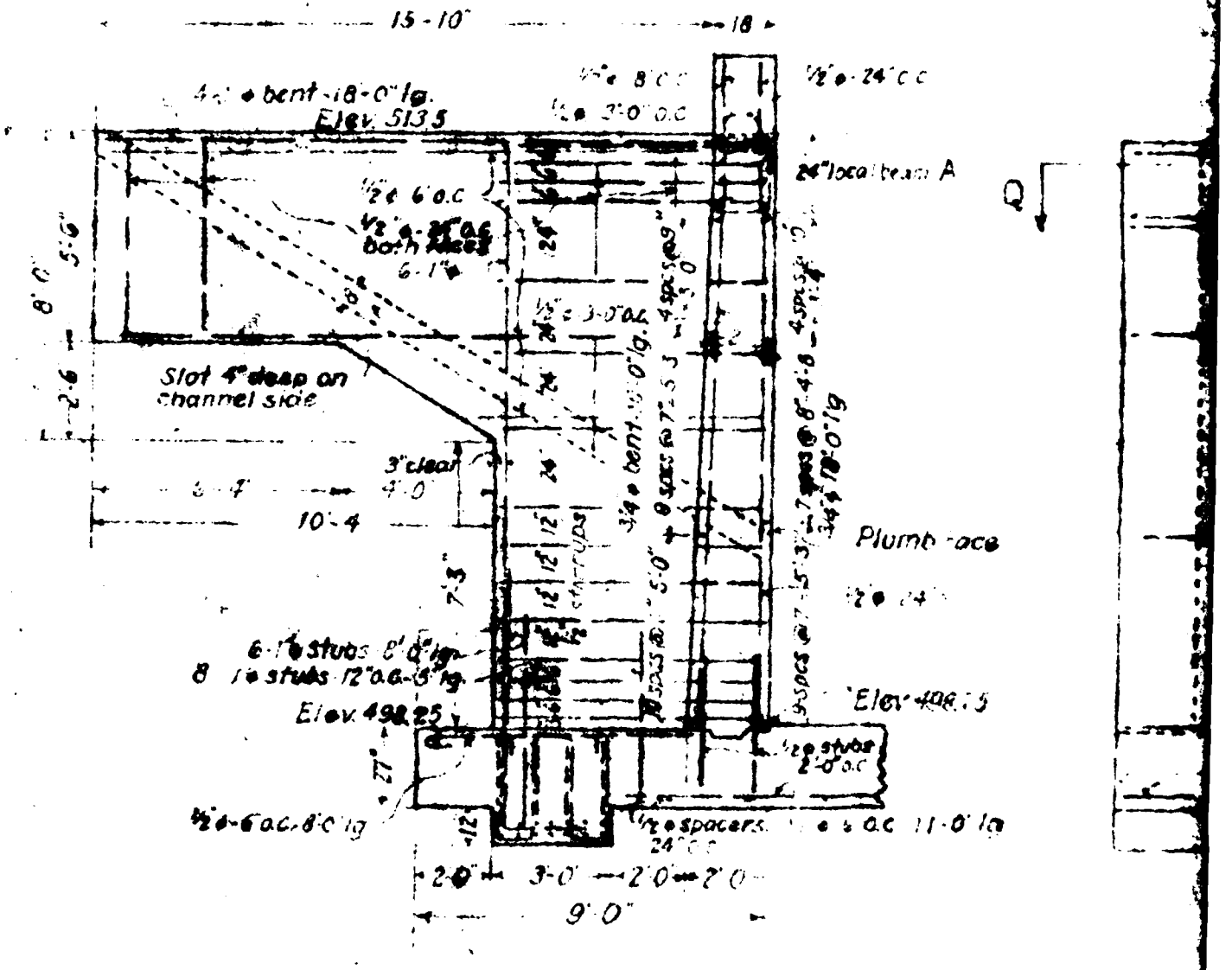

26'-6"
El. 510 Spillway dam omitted above
this joint for center 30'0" until
earth dam was completed.
1/2" ⌀ 24" O.C
Elev. 515.0
Elev. 510.0
12" Paving filled with concrete
20'-10
Elev. 510.0
N
O
Y
R
Mix approximately
Class B Cyclopean Concrete
Excavation
8" concrete wall
Local

tion H-H


Core wall
Local Beam B
Local Beam C
Sectional Plan R-R
Local Beams B and C
Y
Elev. 511.75
Elev. 508.
Section Y-Y
local beam B
Elev. 516.5
local beam C
Line of excavation

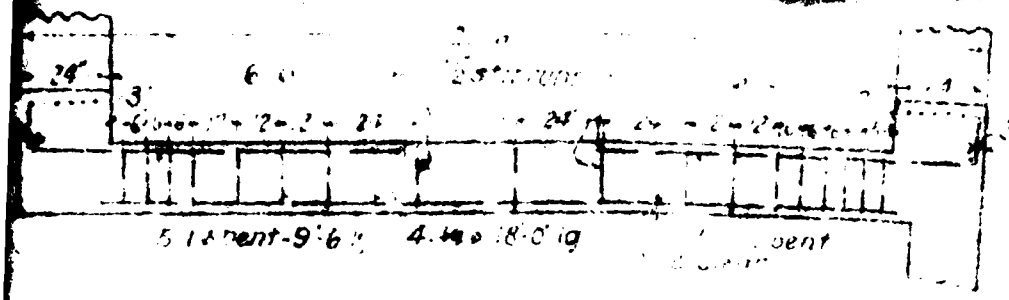


Section P-P

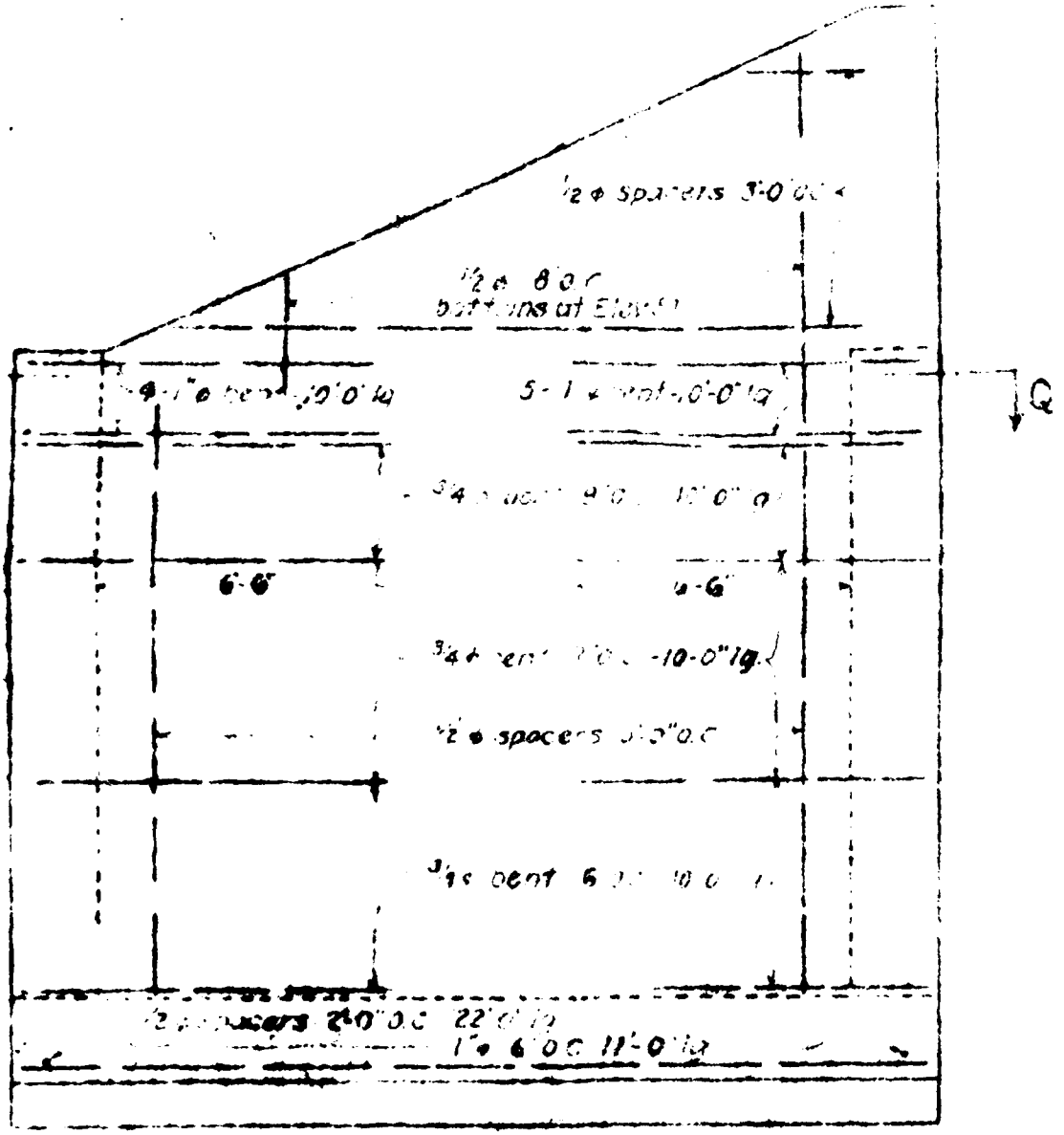


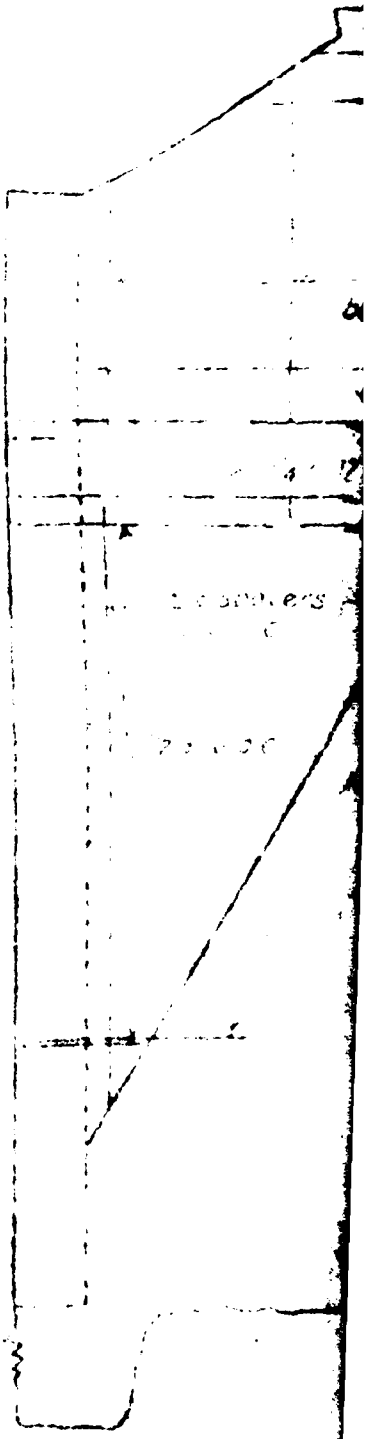
Section L-L

Drawn by E.S.B.
Traced by E.S.B.
Checked by [illegible]



Sectional Plan Q-Q
Local Beam A

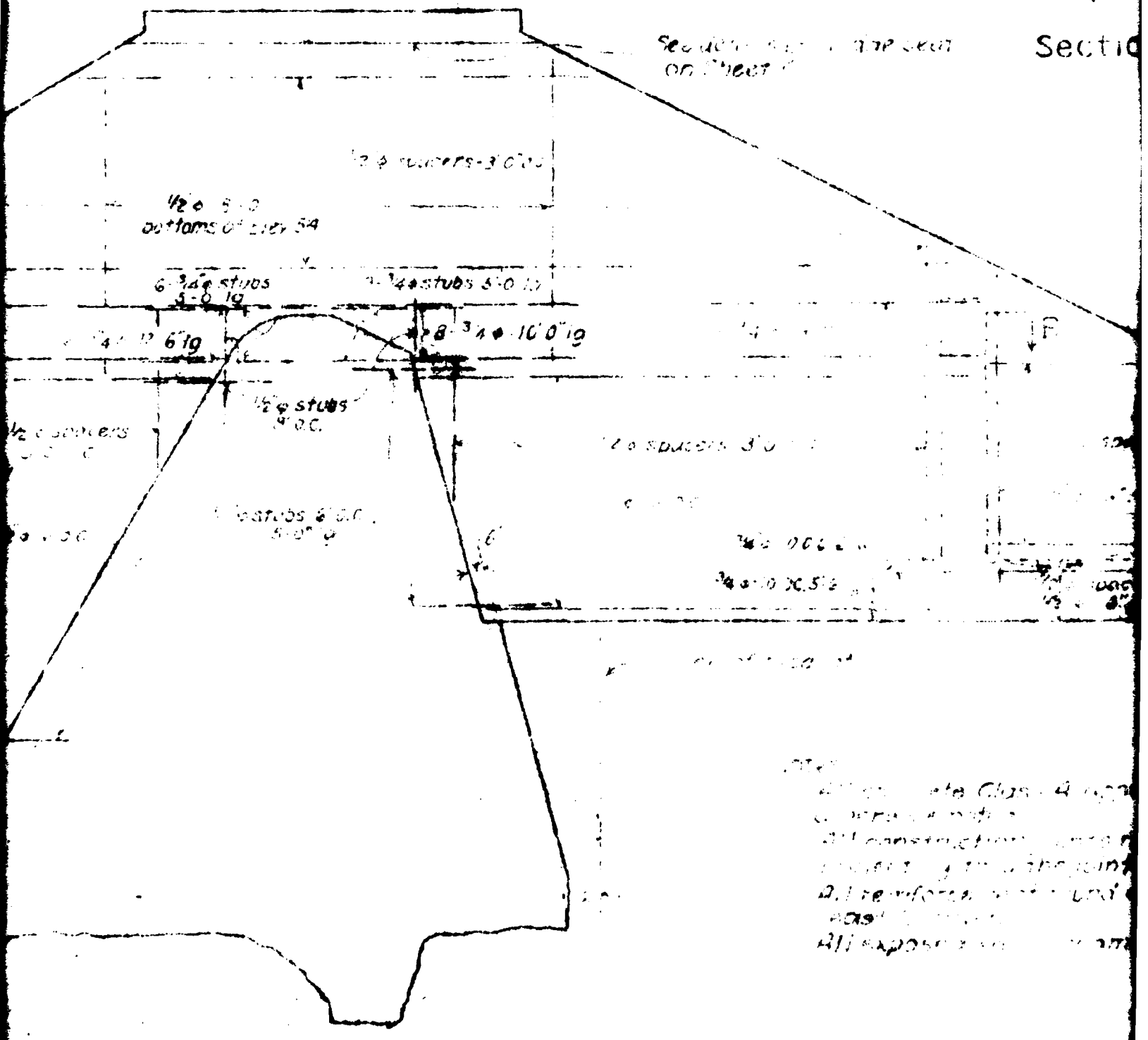




Section 1-1
Reinforcement in back of Wall

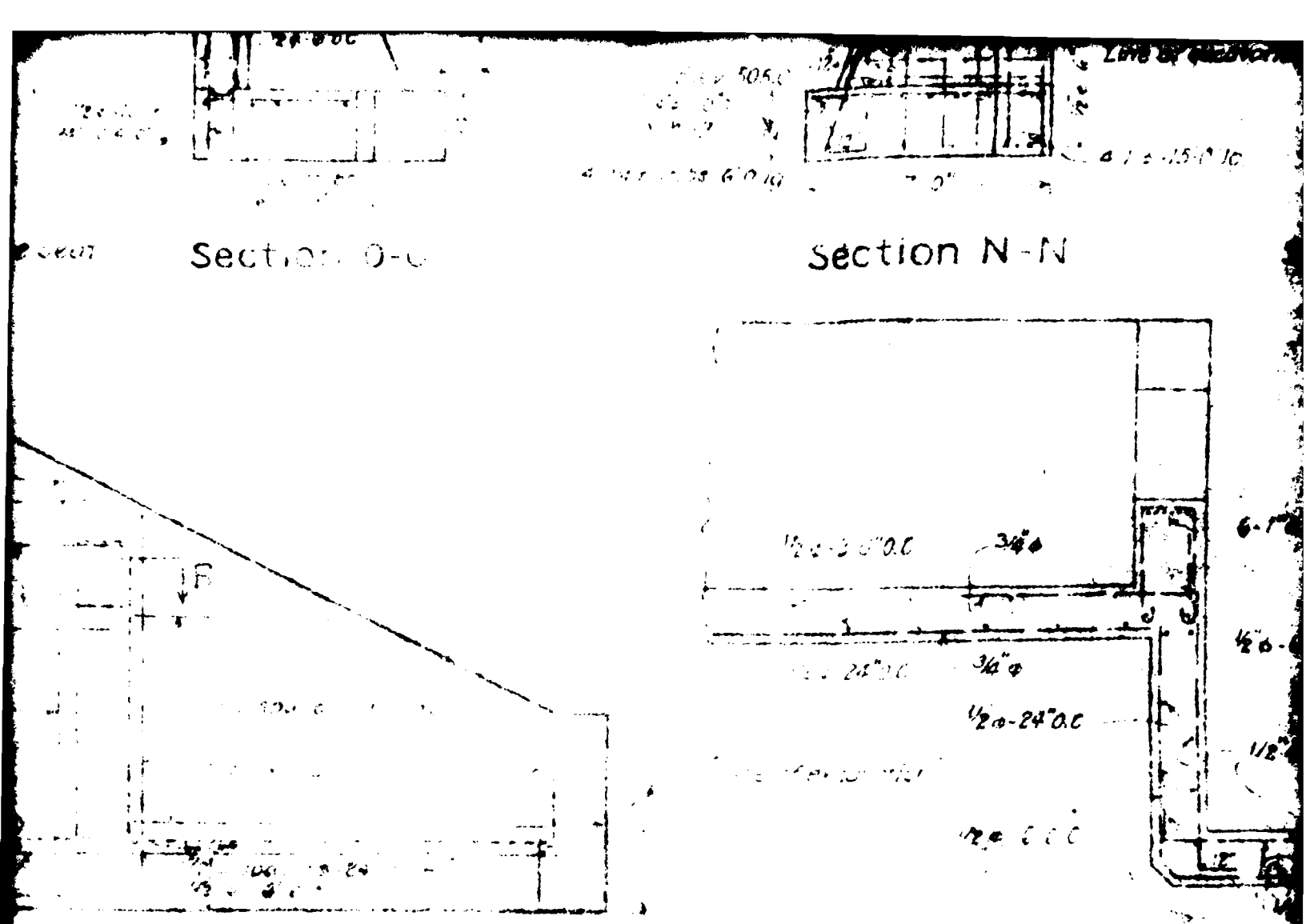
Section H-H

Reinforcement in back of Wall



Section J-J

Reinforcement in back of Wall



Sectional Plan Z-

RECORD

PLATTSBU

MEAD BROOK

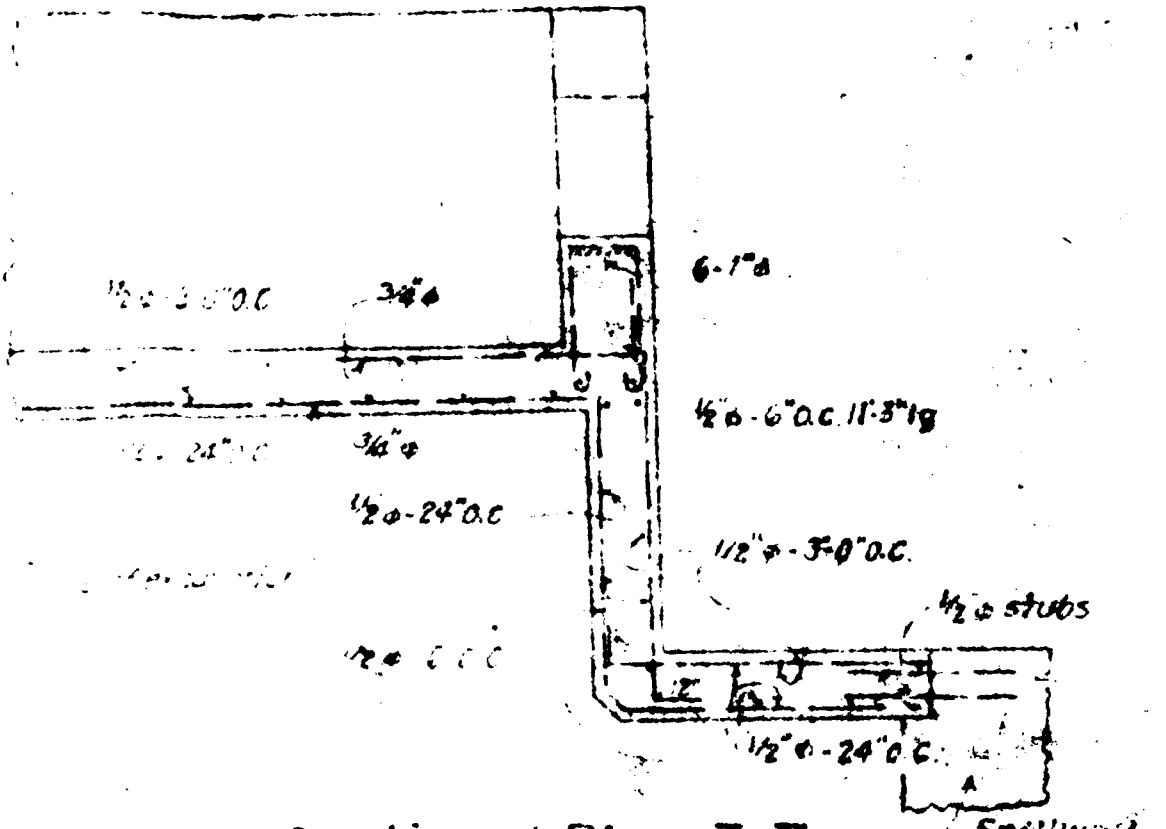
SPILLWAY

SCALE- 1" TO 1'

14

Section N-N

Section M-M



Sectional Plan Z-Z

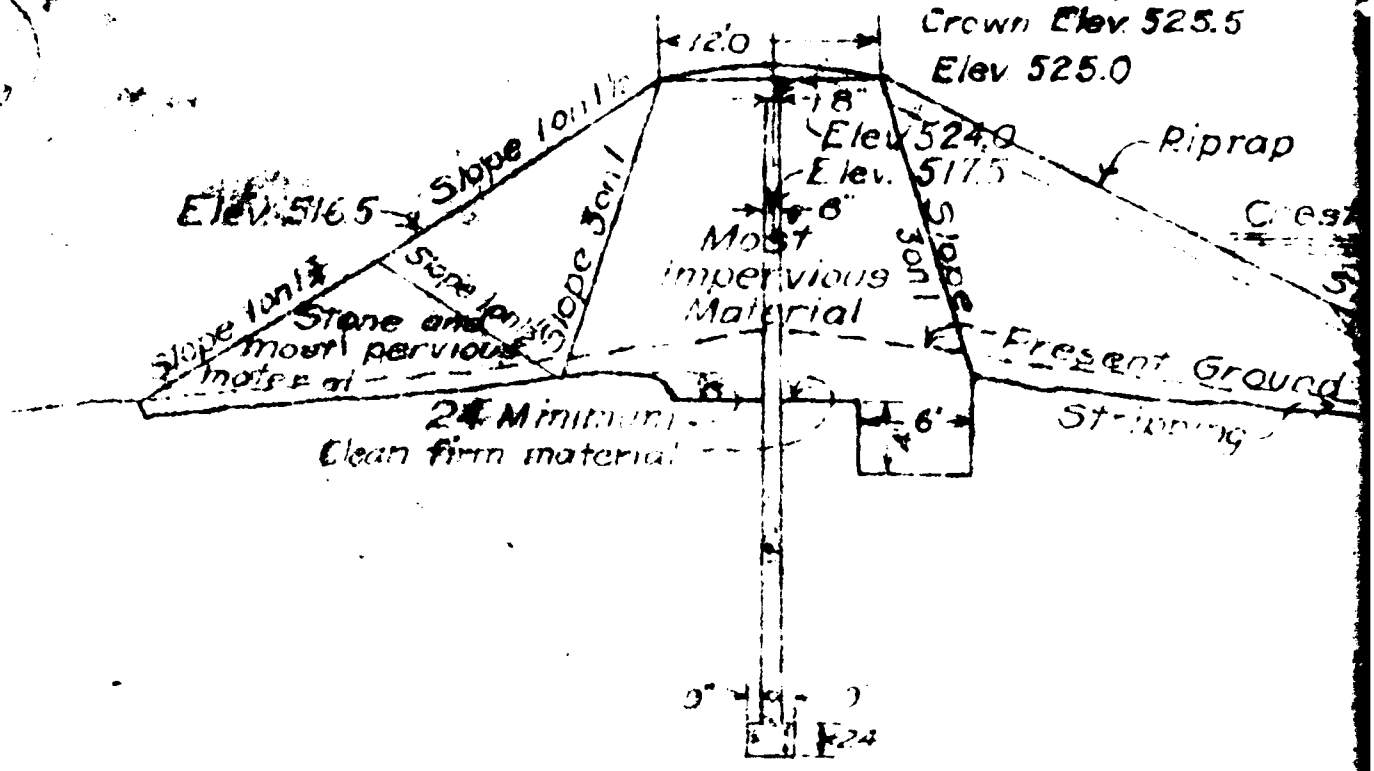
RECORD PLAN

PLATTSBURGH, N.Y.

MEAD BROOK RESERVOIR

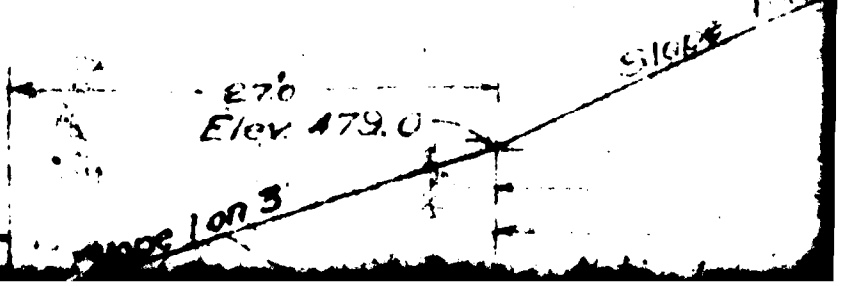
SPILLWAY ABUTMENTS

SCALE 1" TO 1' DEC. 23



Section C-C

Scale 10'to



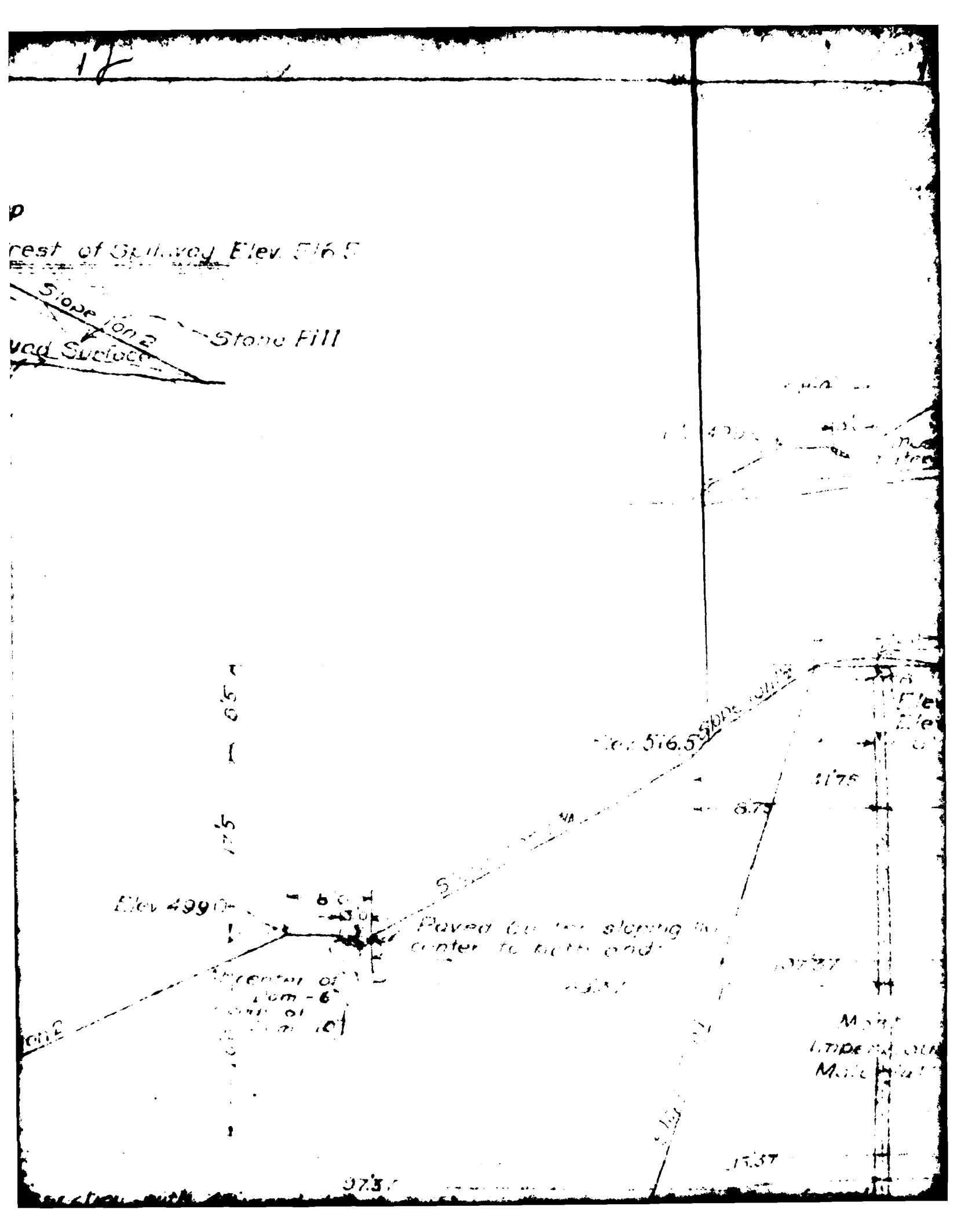
p

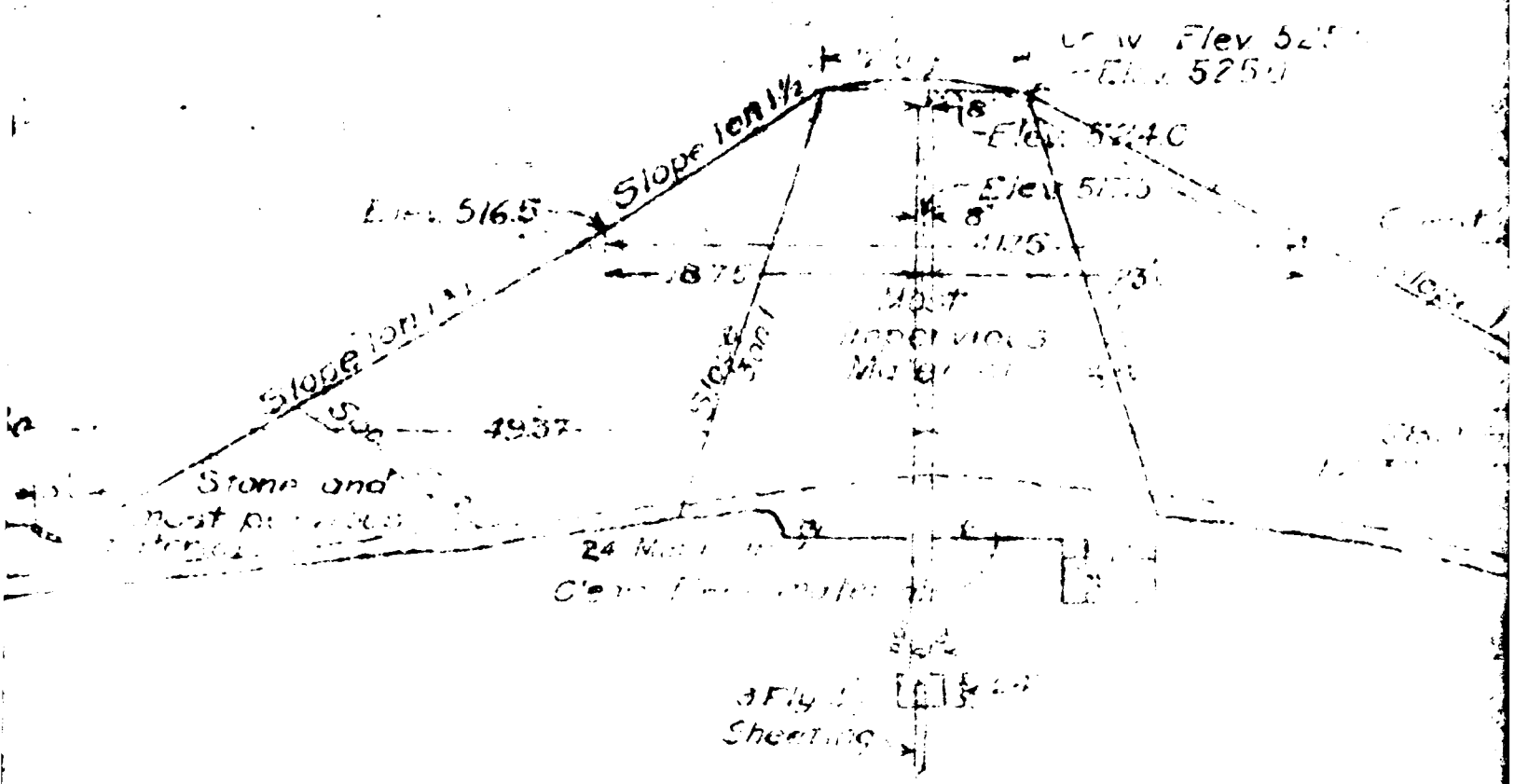
rest of Spillway Elev. 516.5

Slope Zone

Stone Fill

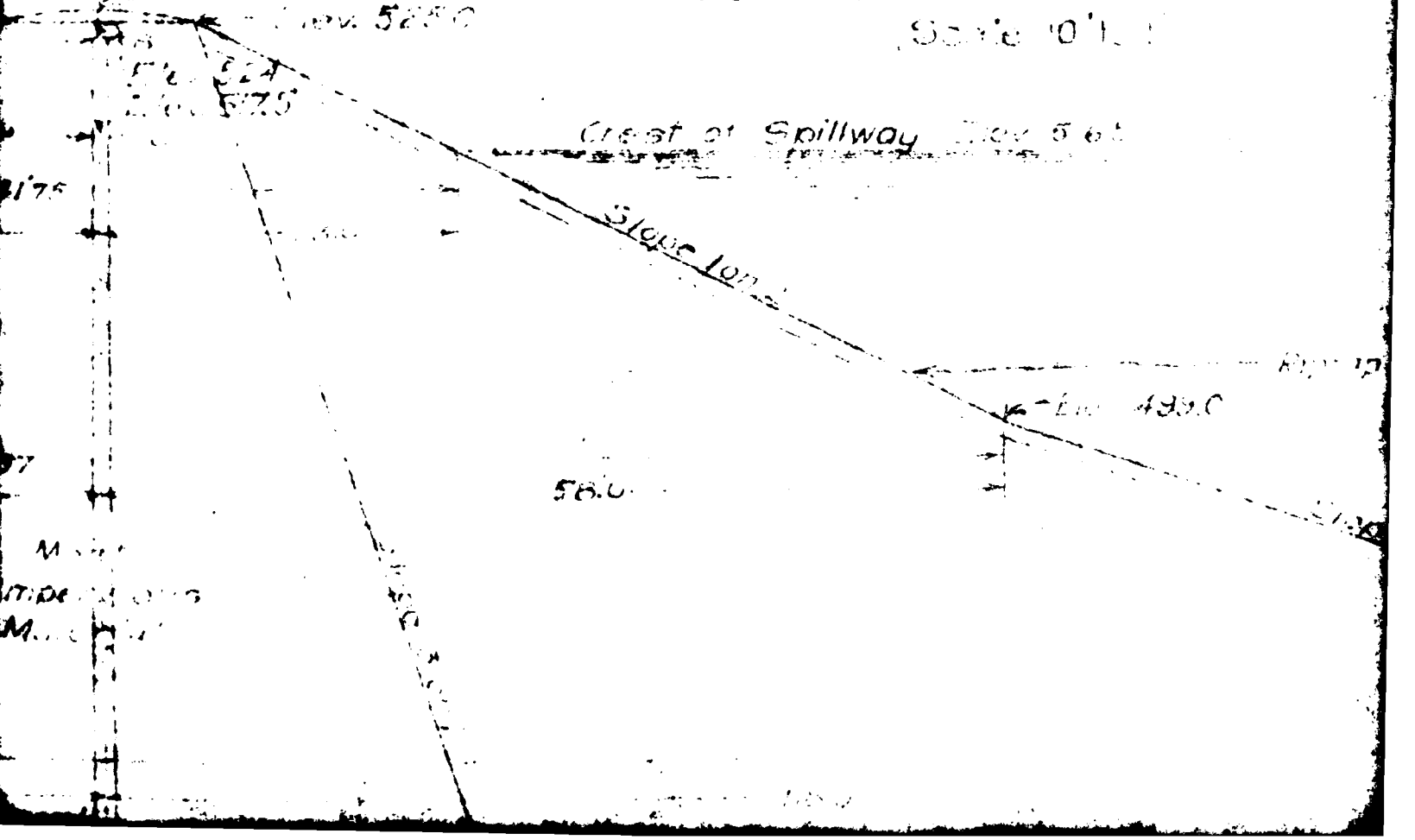
ved Subbase

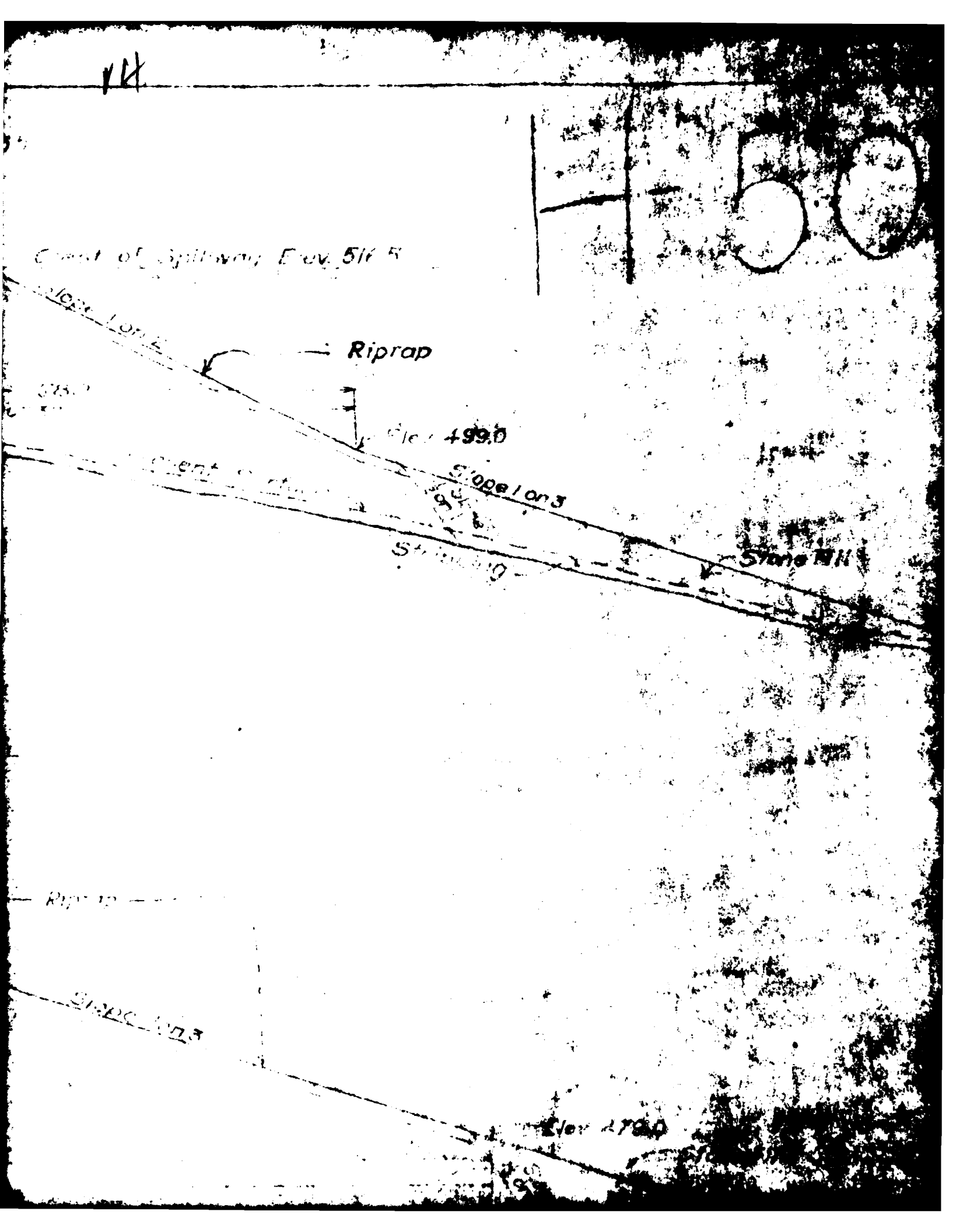


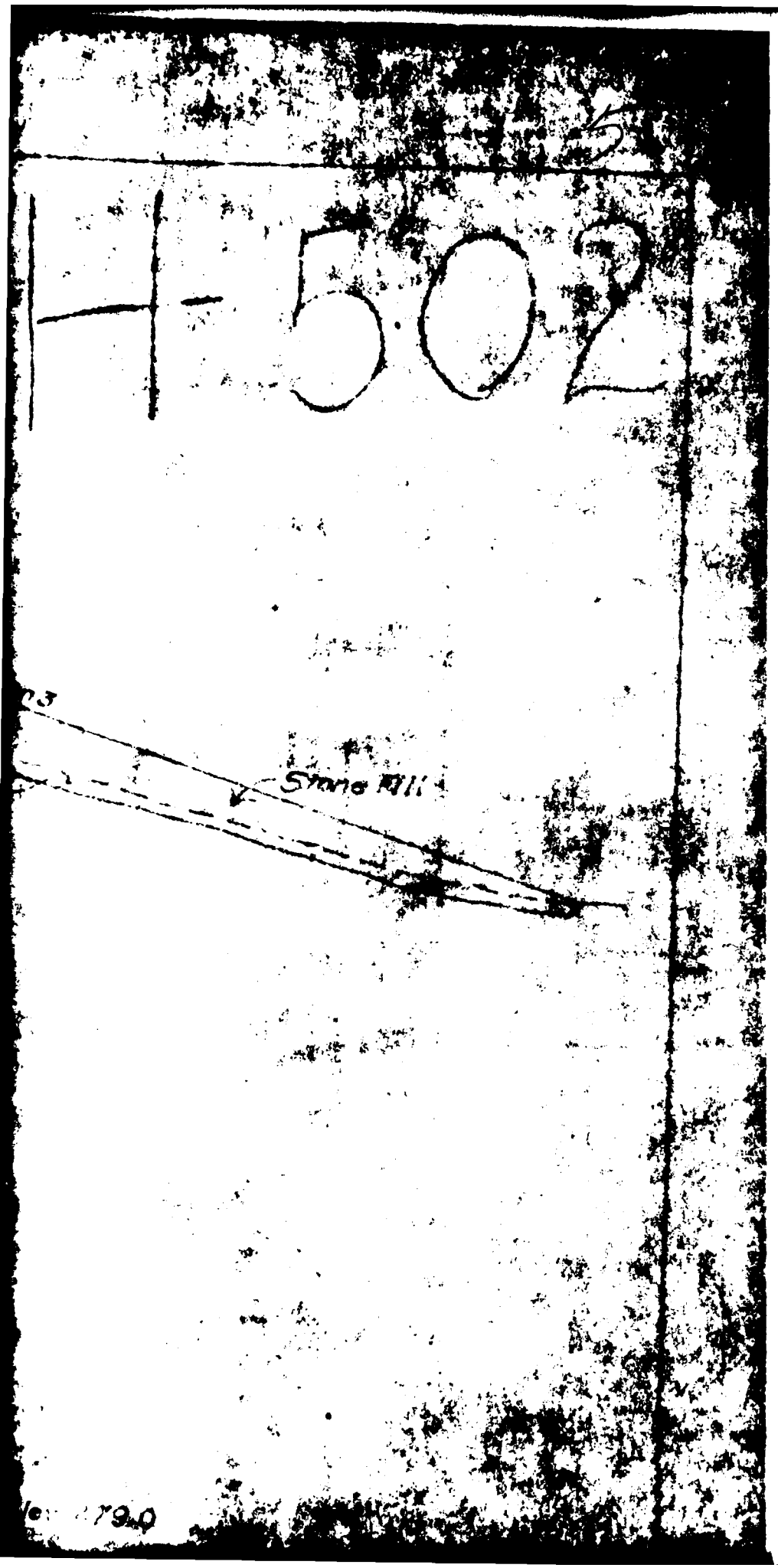


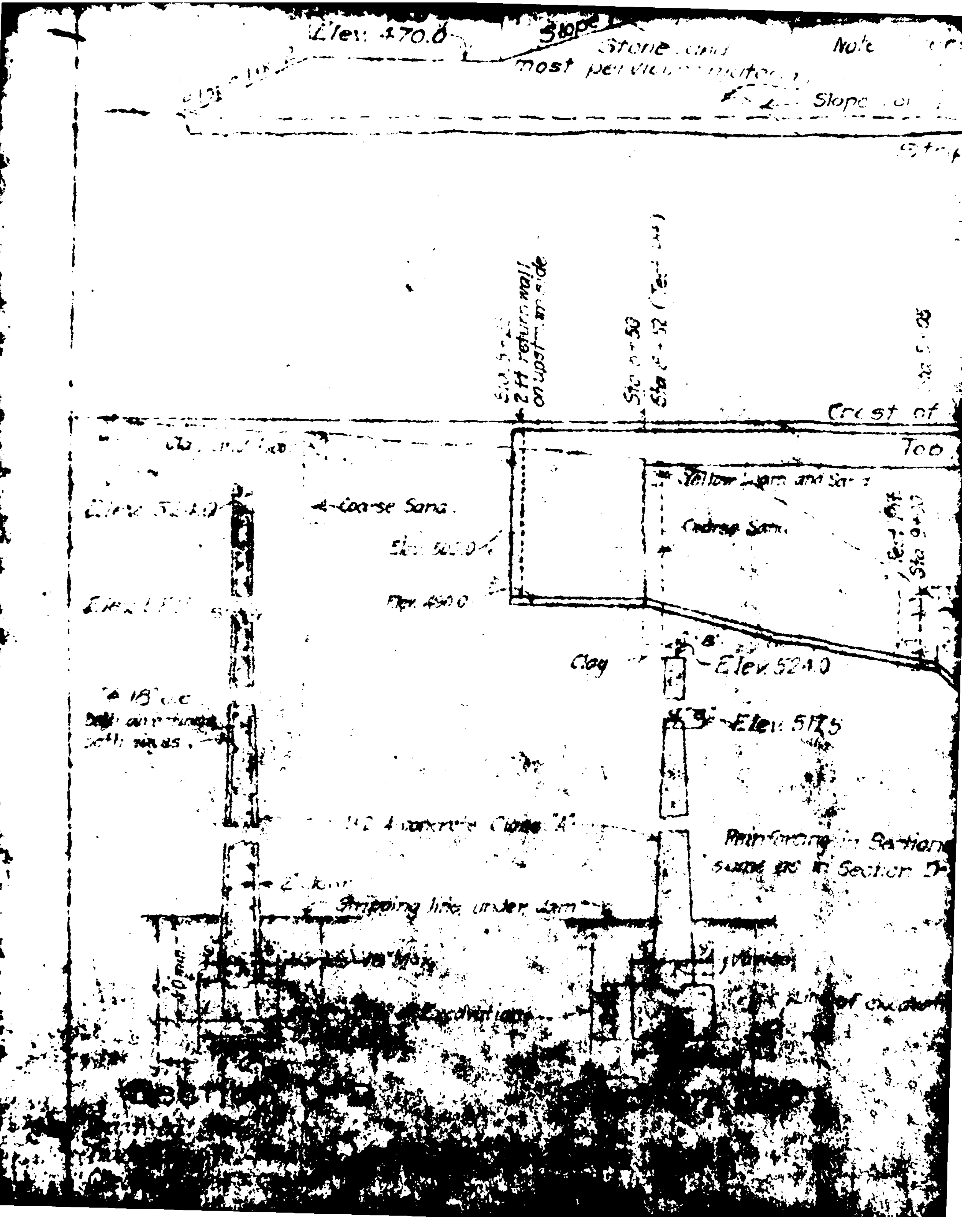
Section B-B.

Scale 10'=1"

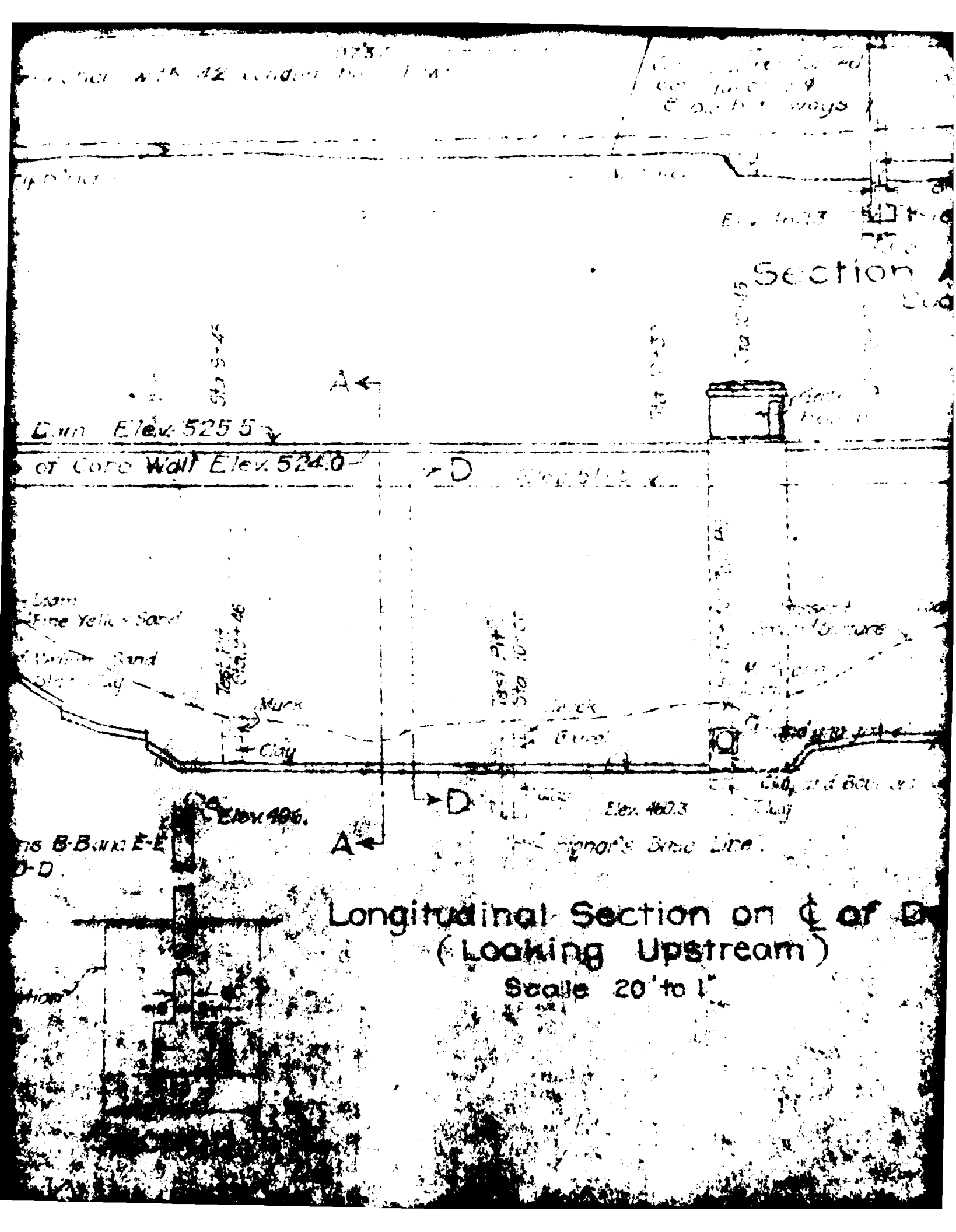


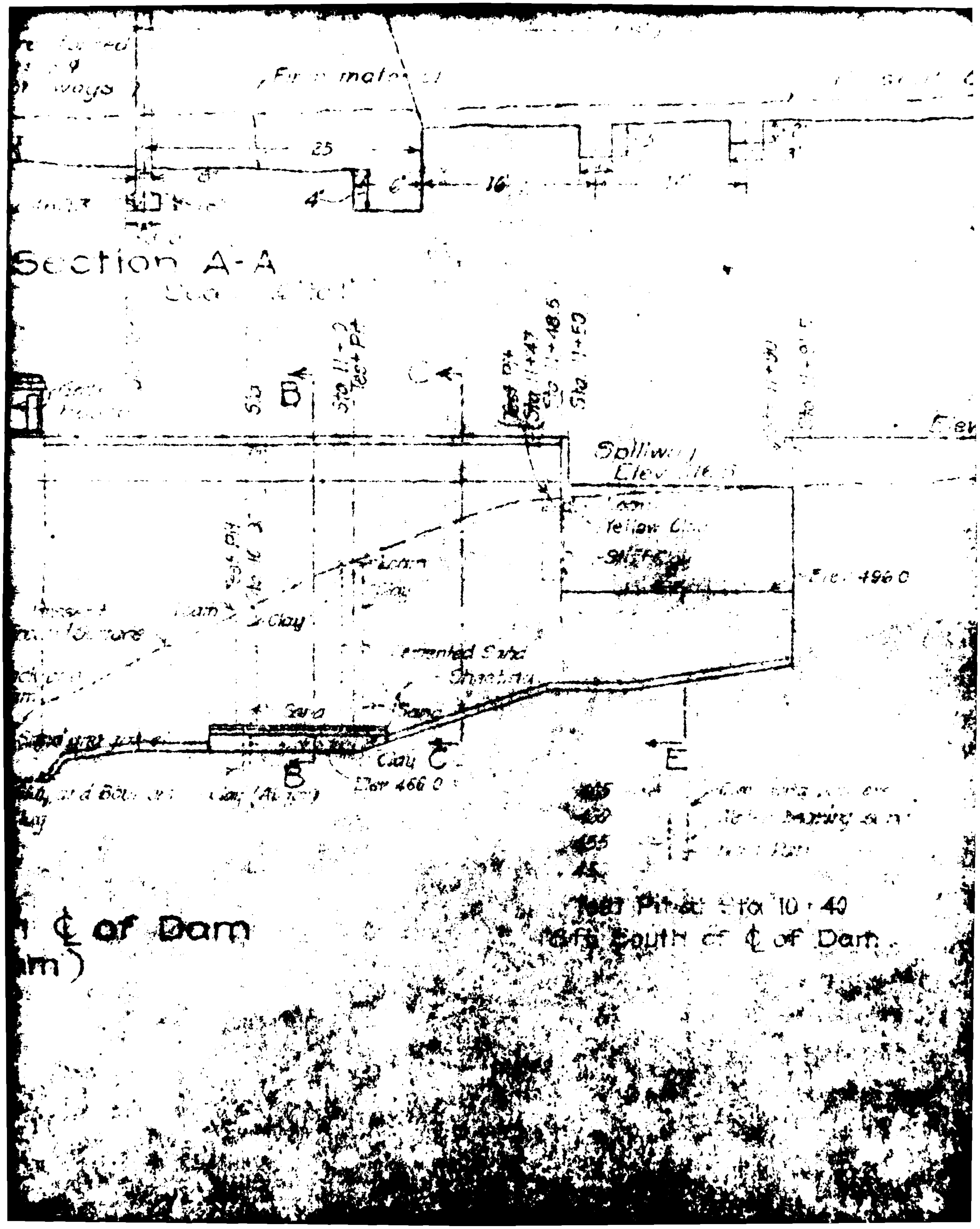

Riprap
Elev 499.0
Slope 1 on 3
Stone Fill


Stone Hill

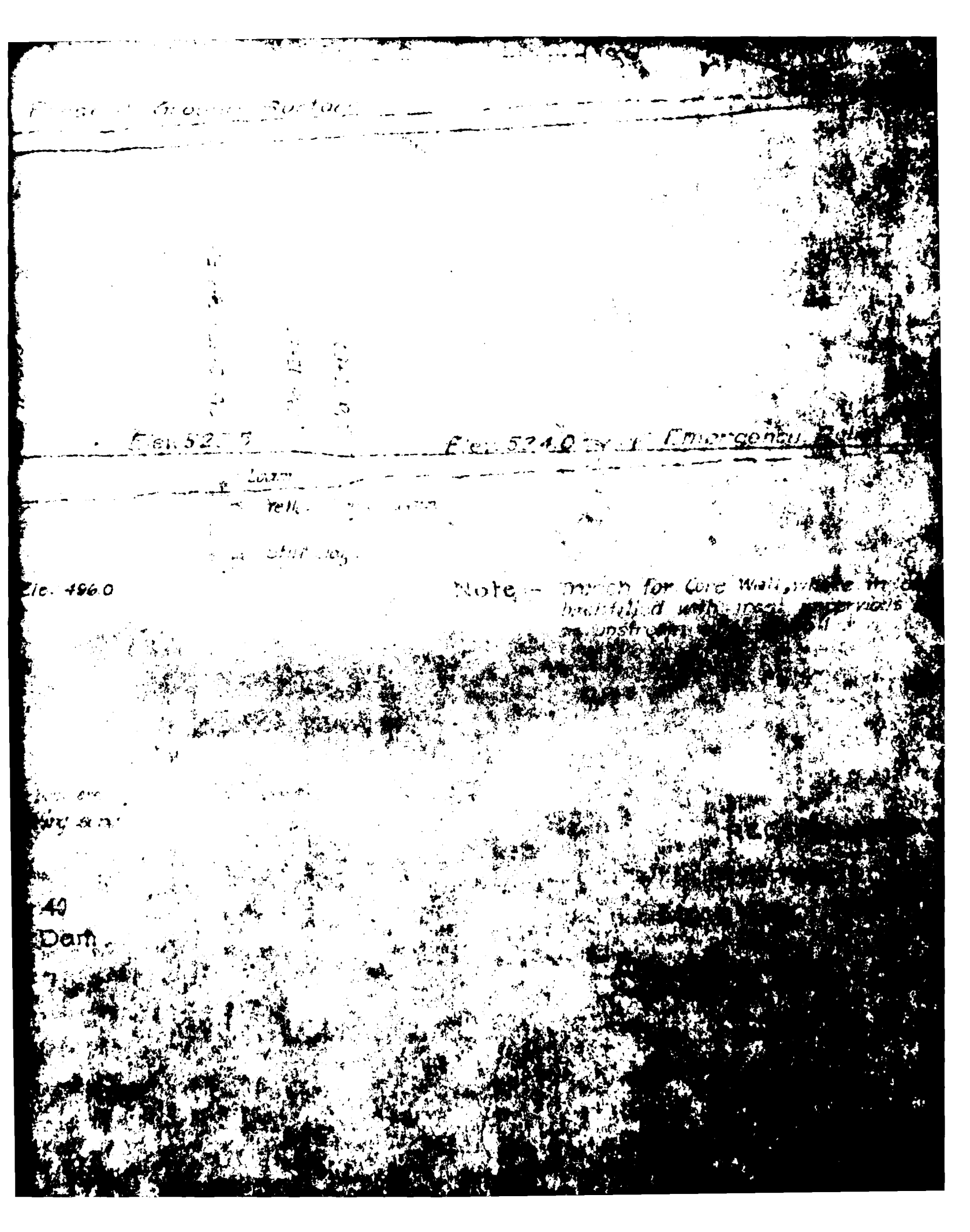


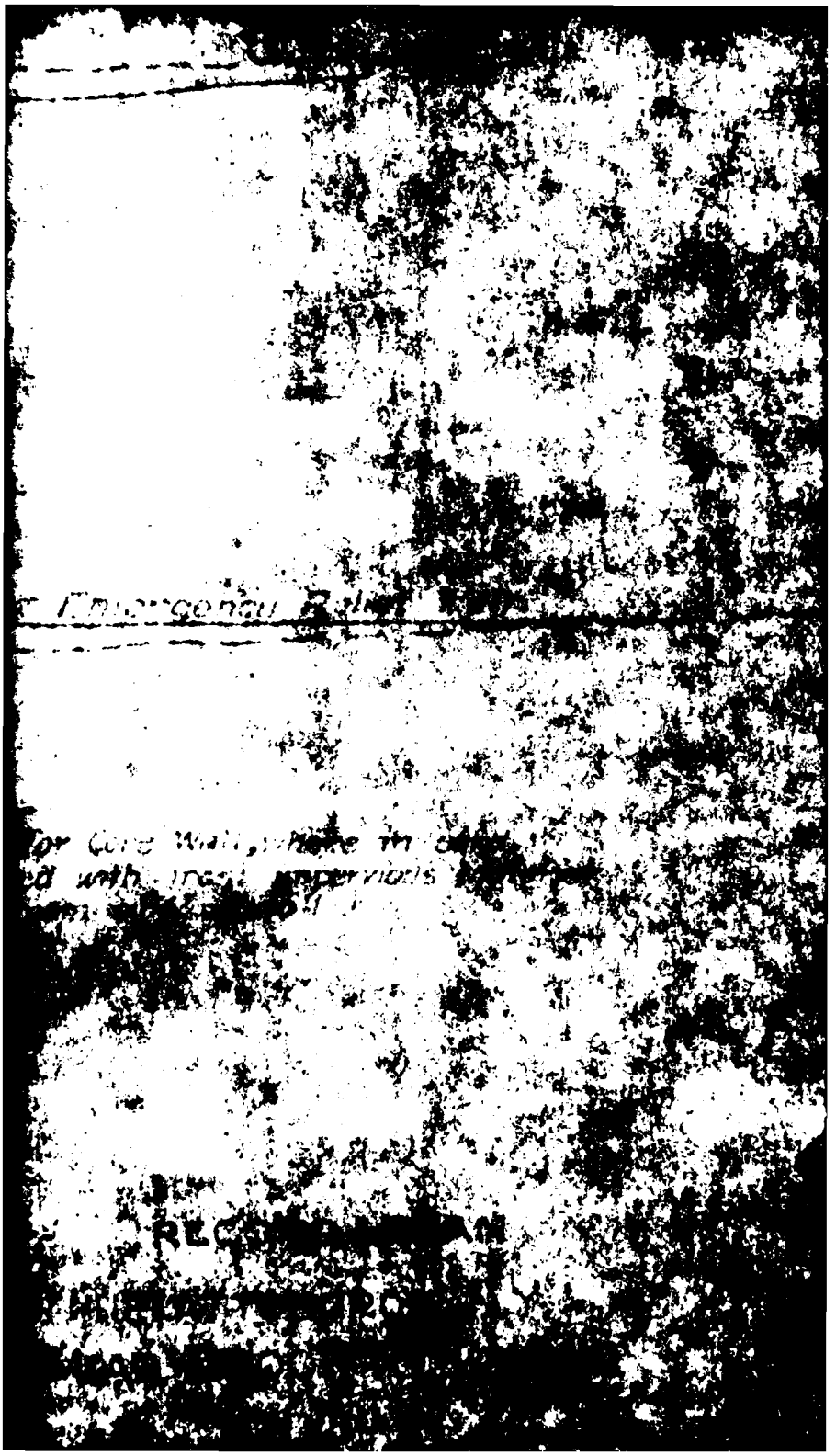
Elev. 470.0
Slope
Stone and
most pervious
Note
Slope
2 ft return wall on upstream side
Crest of
Top
Yellow Loam and Sand
Coarse Sand
Coarse Sand
Elev. 500.0
Elev. 490.0
Clay
Elev. 524.0
Elev. 517.5
18" c.c.
Reinforcing in Section
same as in Section

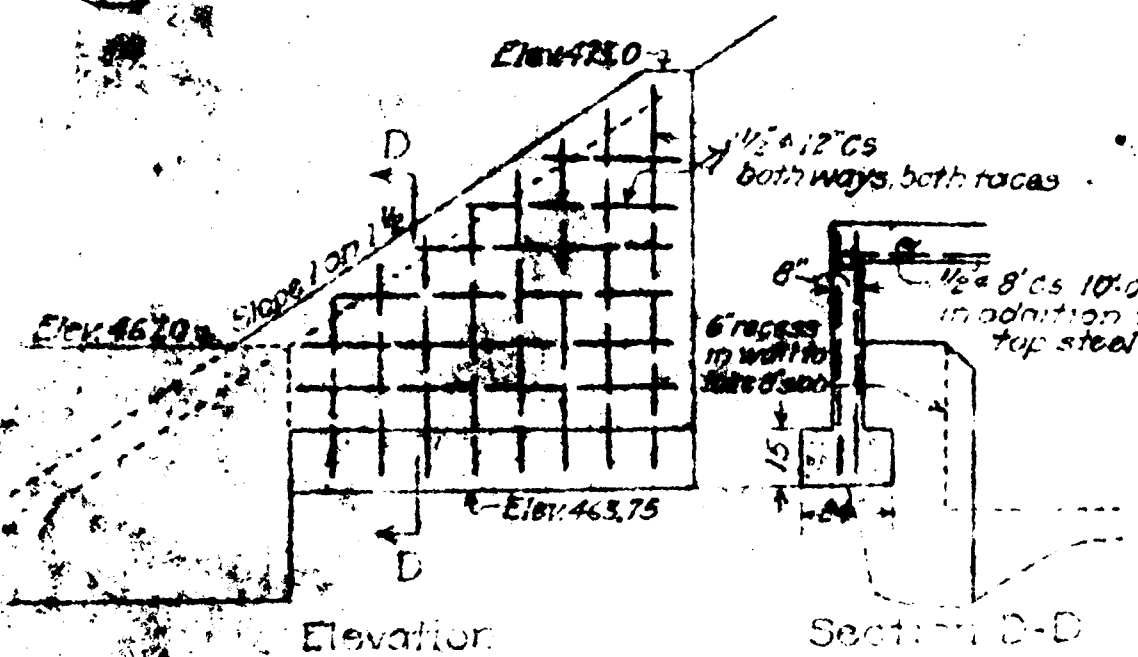

Section
A
D
Elev. 525.5
of Core Wall Elev. 524.0
Loam
Fine Yellow Sand
Muck
Clay
Elev. 496.
Elev. 480.3
A
D
Longitudinal Section on ℄ of D
(Looking Upstream)
Scale 20' to 1"



25
4'
6'
16
Section A-A
B
C
Spillway
Yellow Clay
Elev. 496.0
Clay
Sand
Clay C
Elev 466.0
E
Test Pit at Sta 10+40
South of ℄ of Dam
℄ of Dam


Emergency
Dam

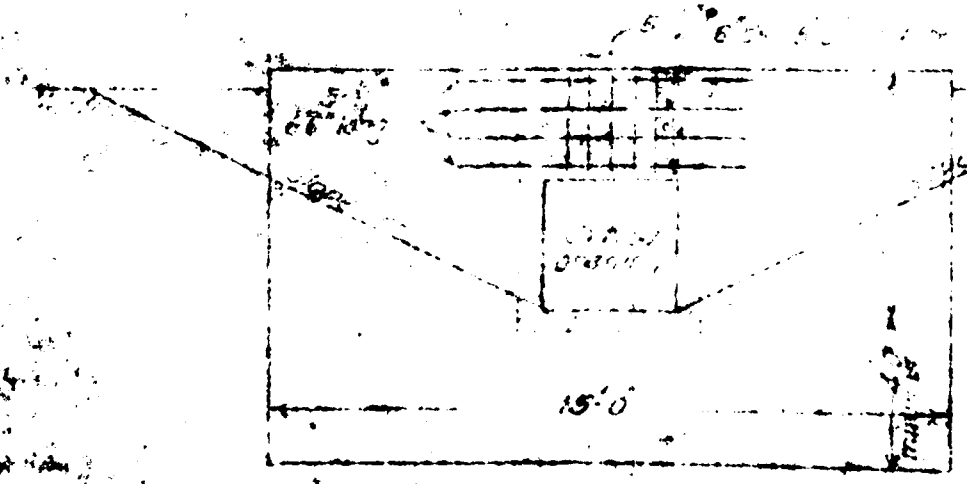




East End of Wall at Sta. 3 + 02.1

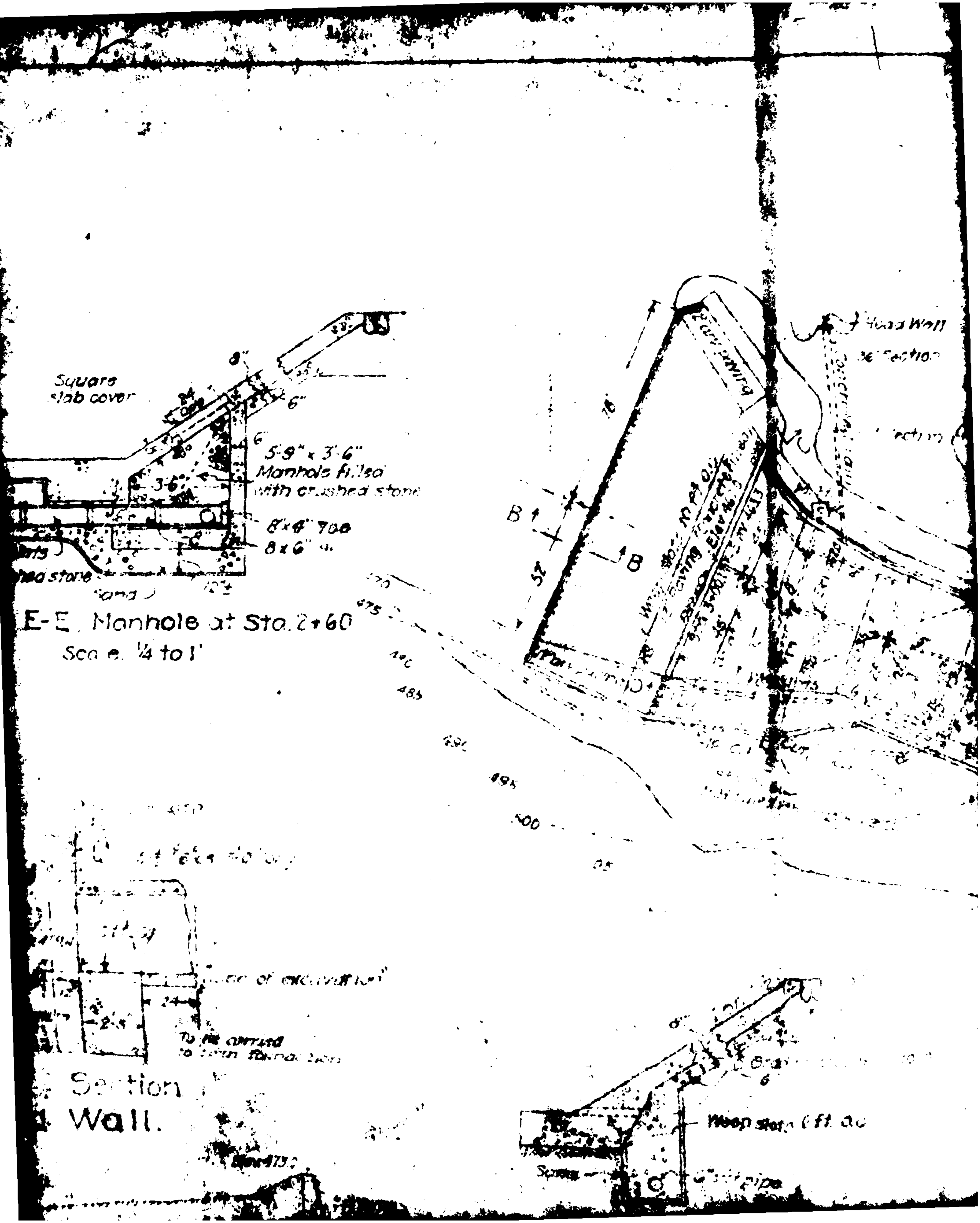
Scale ¼" to 1'

Section E-

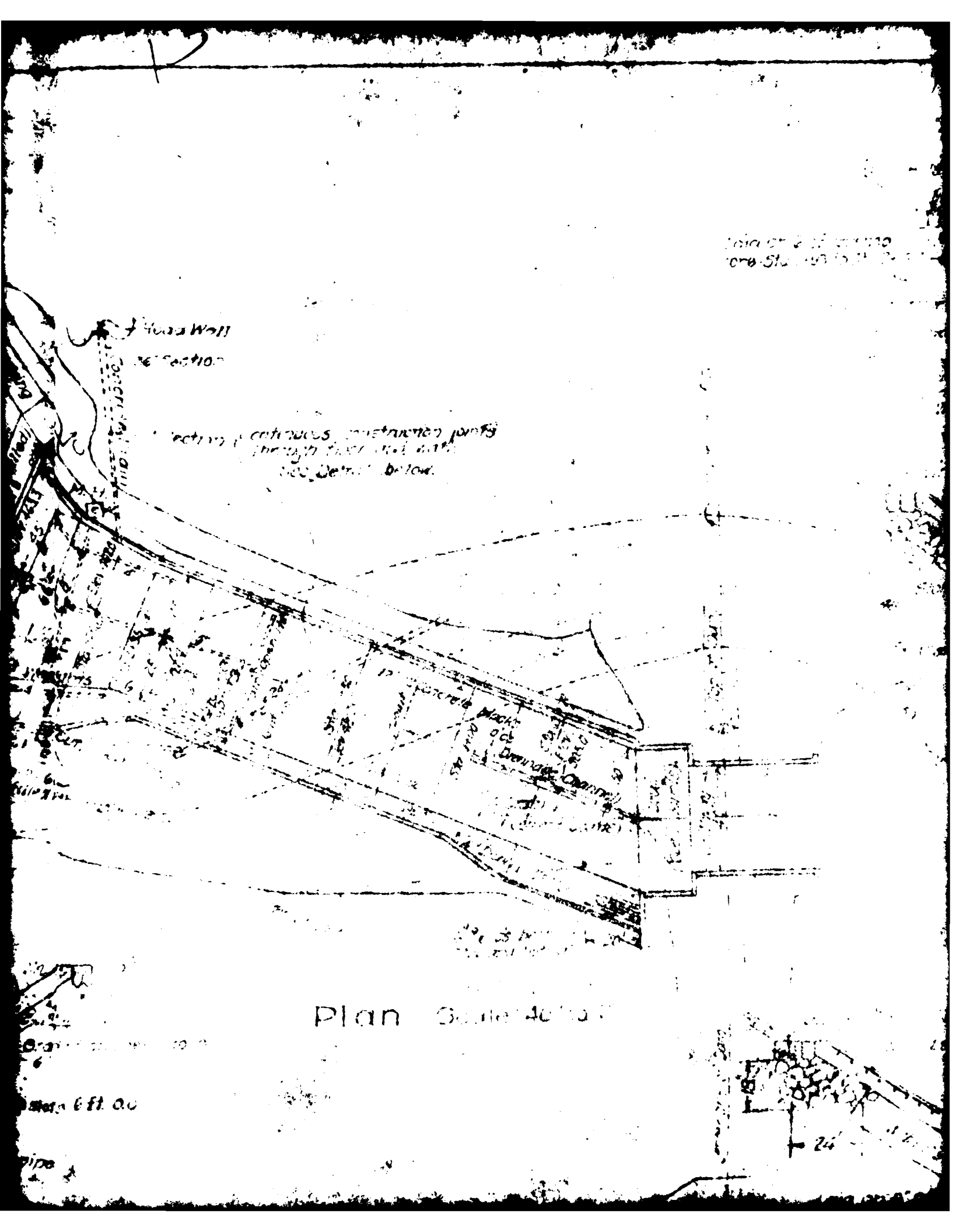


Elevation

Details of Drain Head

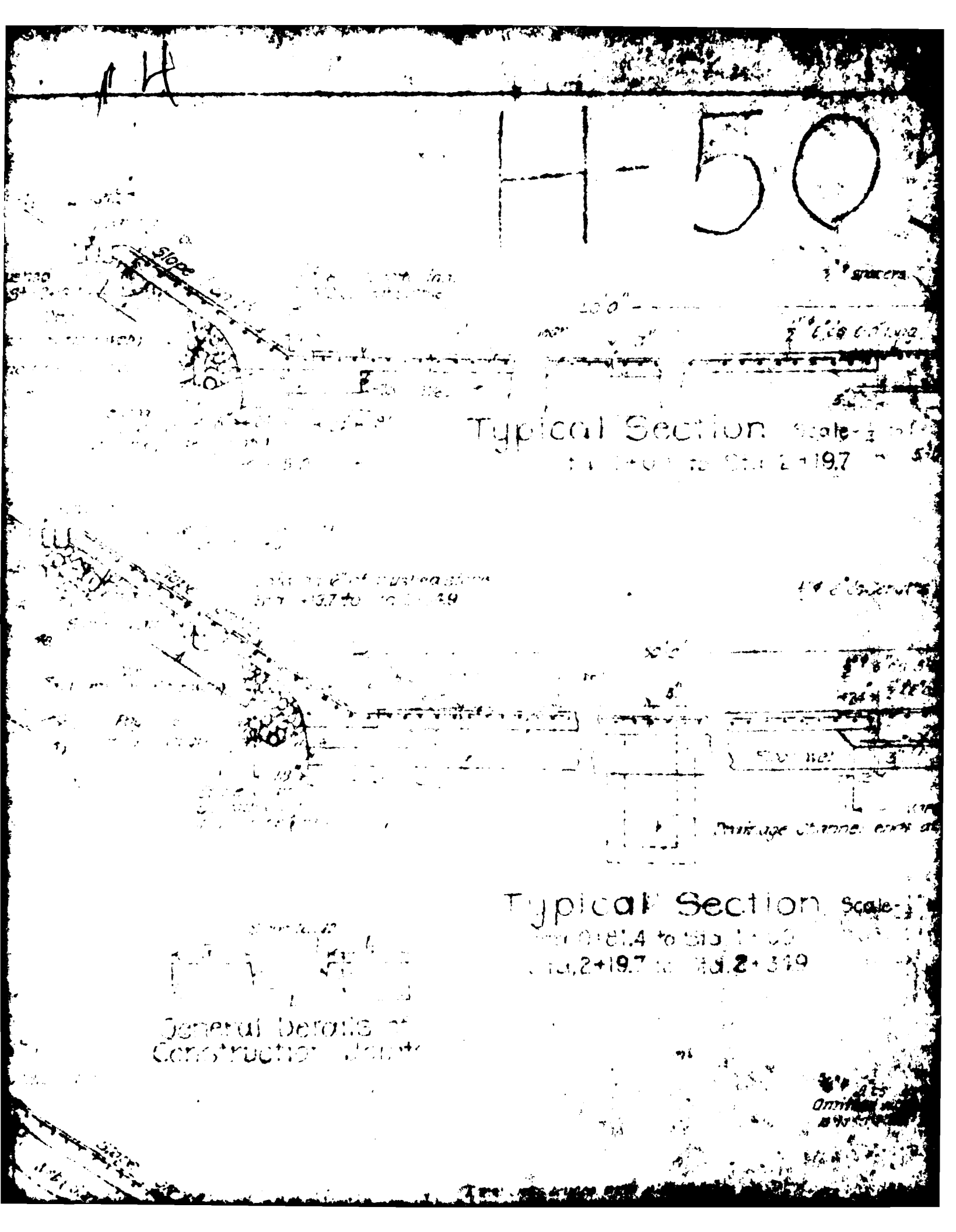


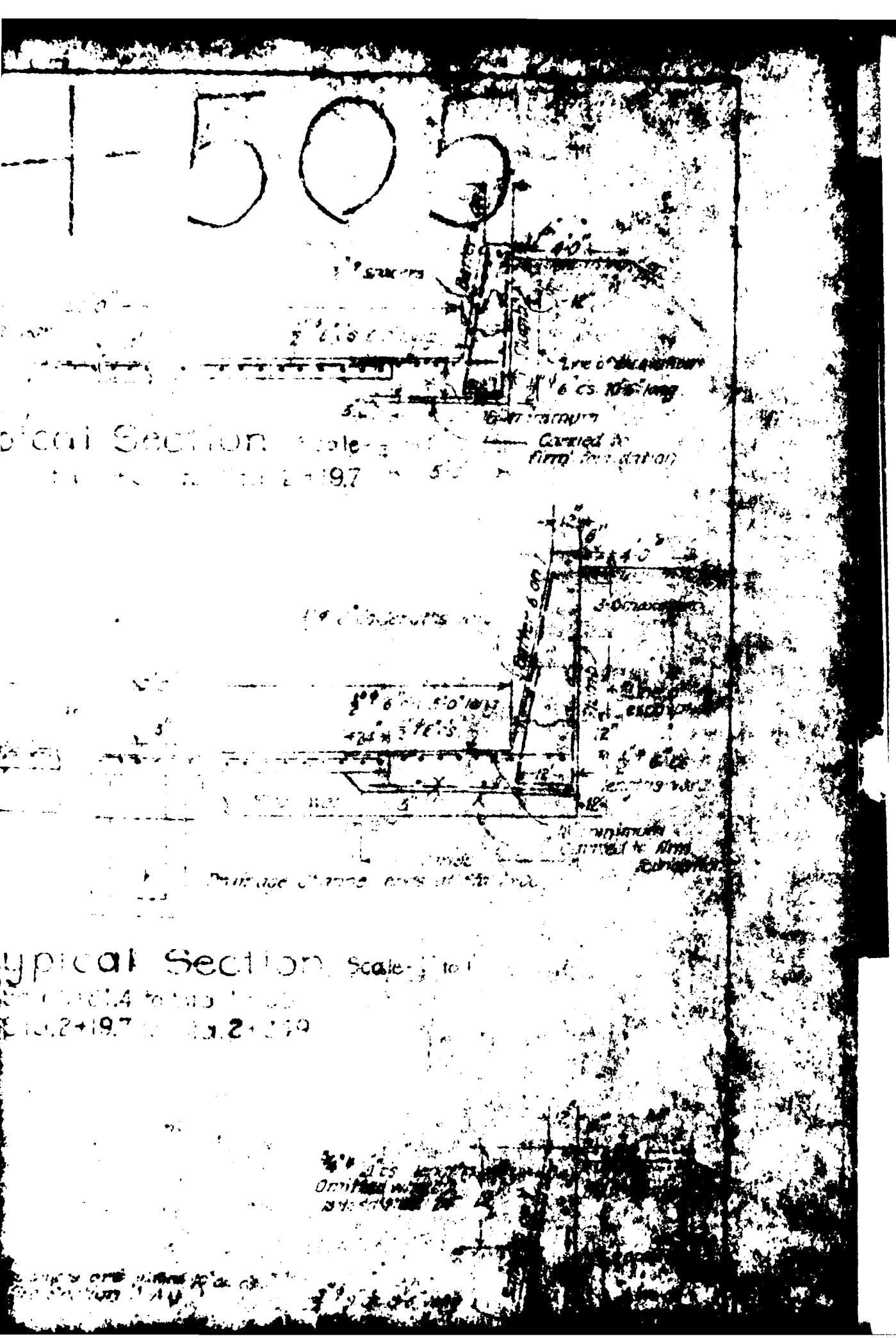
Square slab cover
5-9" x 3'-6"
Manhole filled with crushed stone
8"x4" Tee
8 x 6"
E-E, Manhole at Sta. 2+60
Scale ¼ to 1'
B
B
Head Wall
Section
Weep slots 6 ft. oc
pipe
Section
Wall.

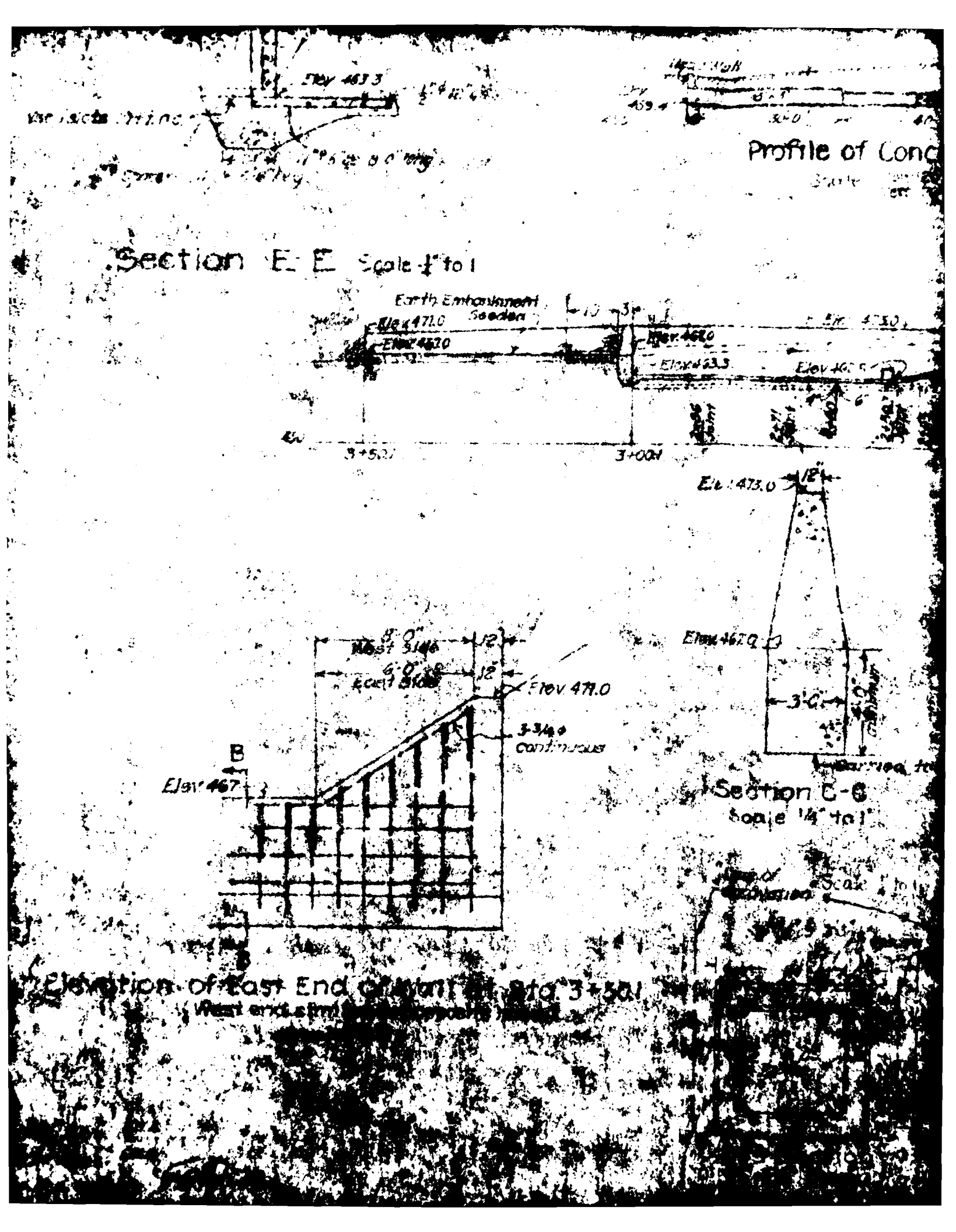

Plan

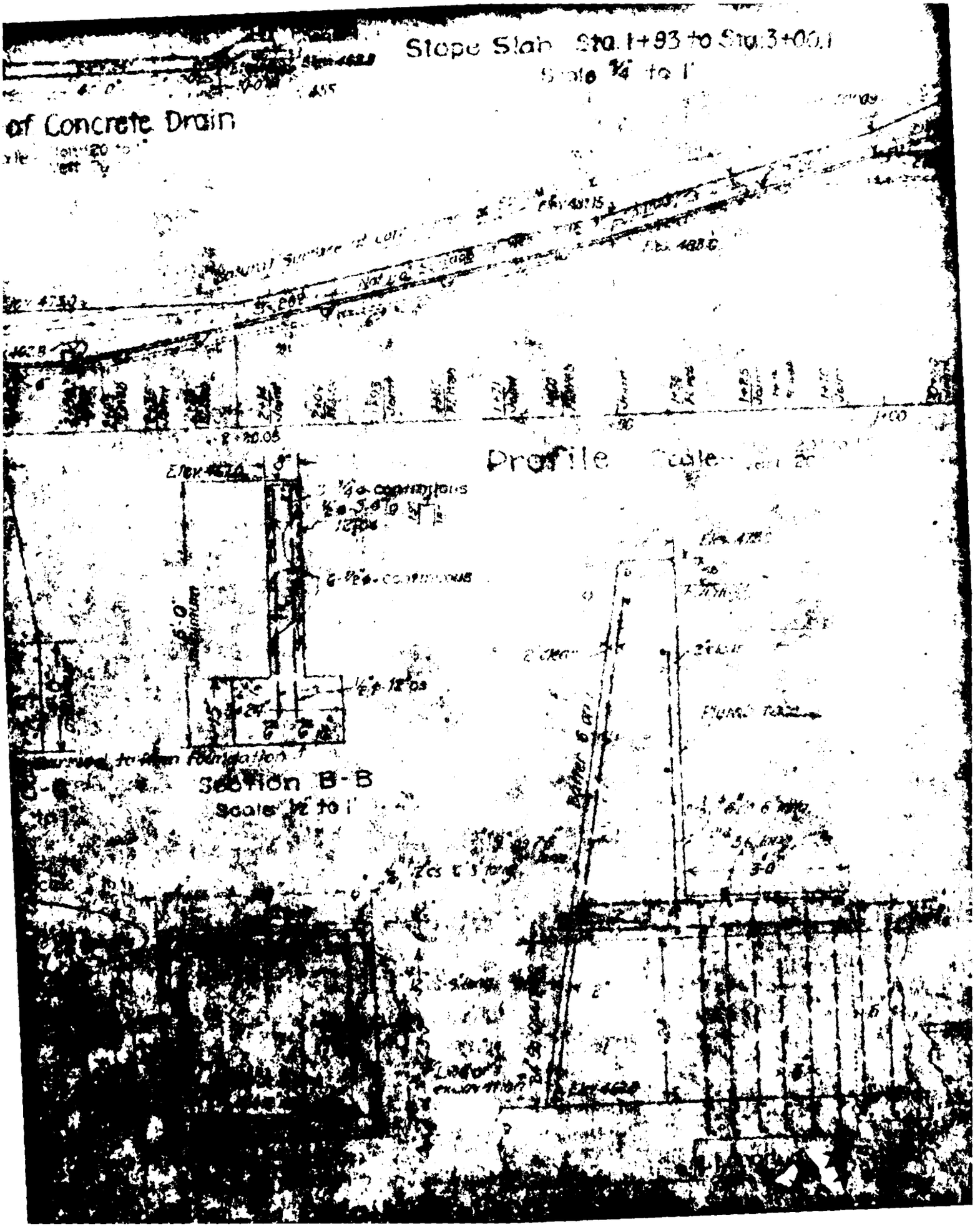
H

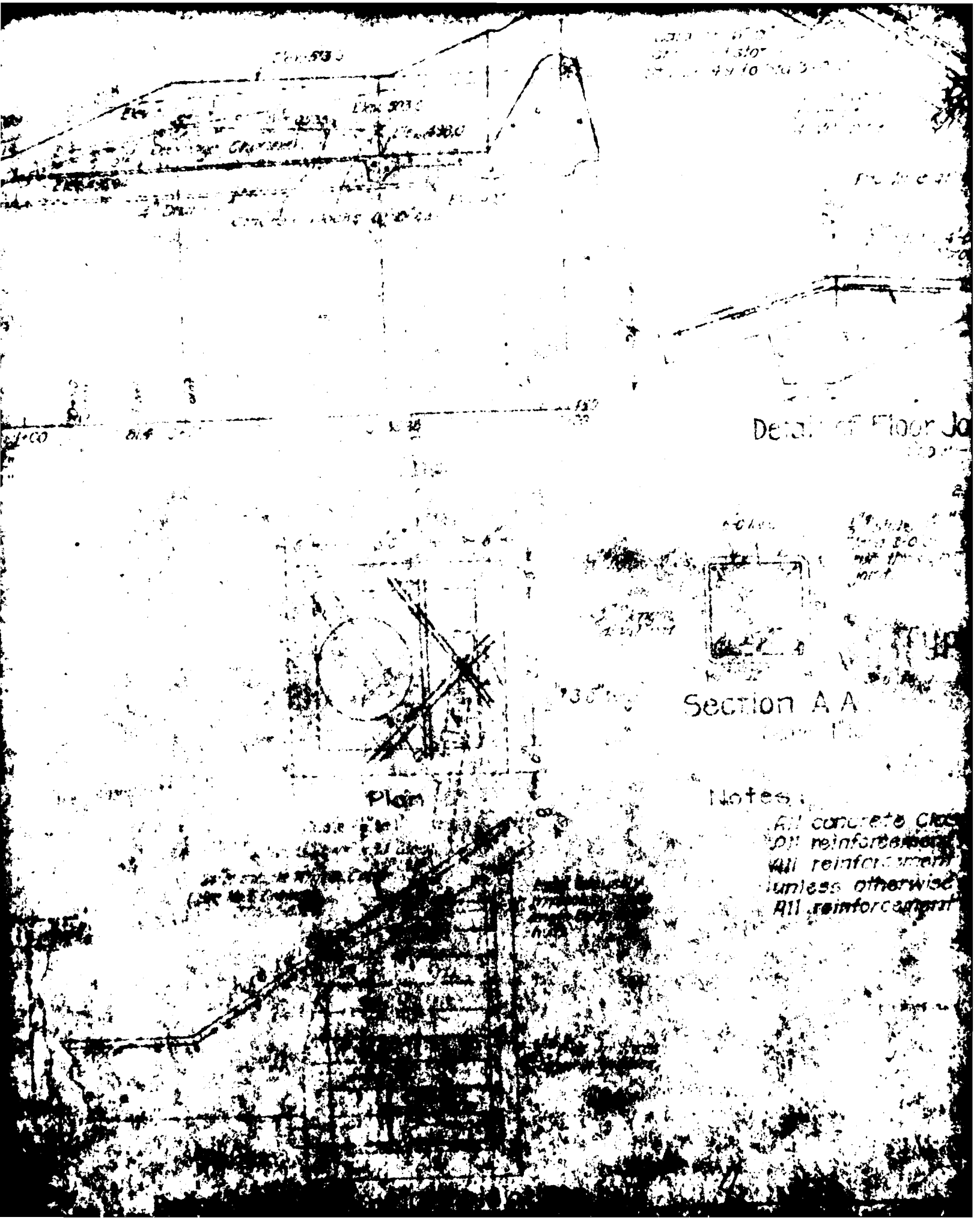
H-50

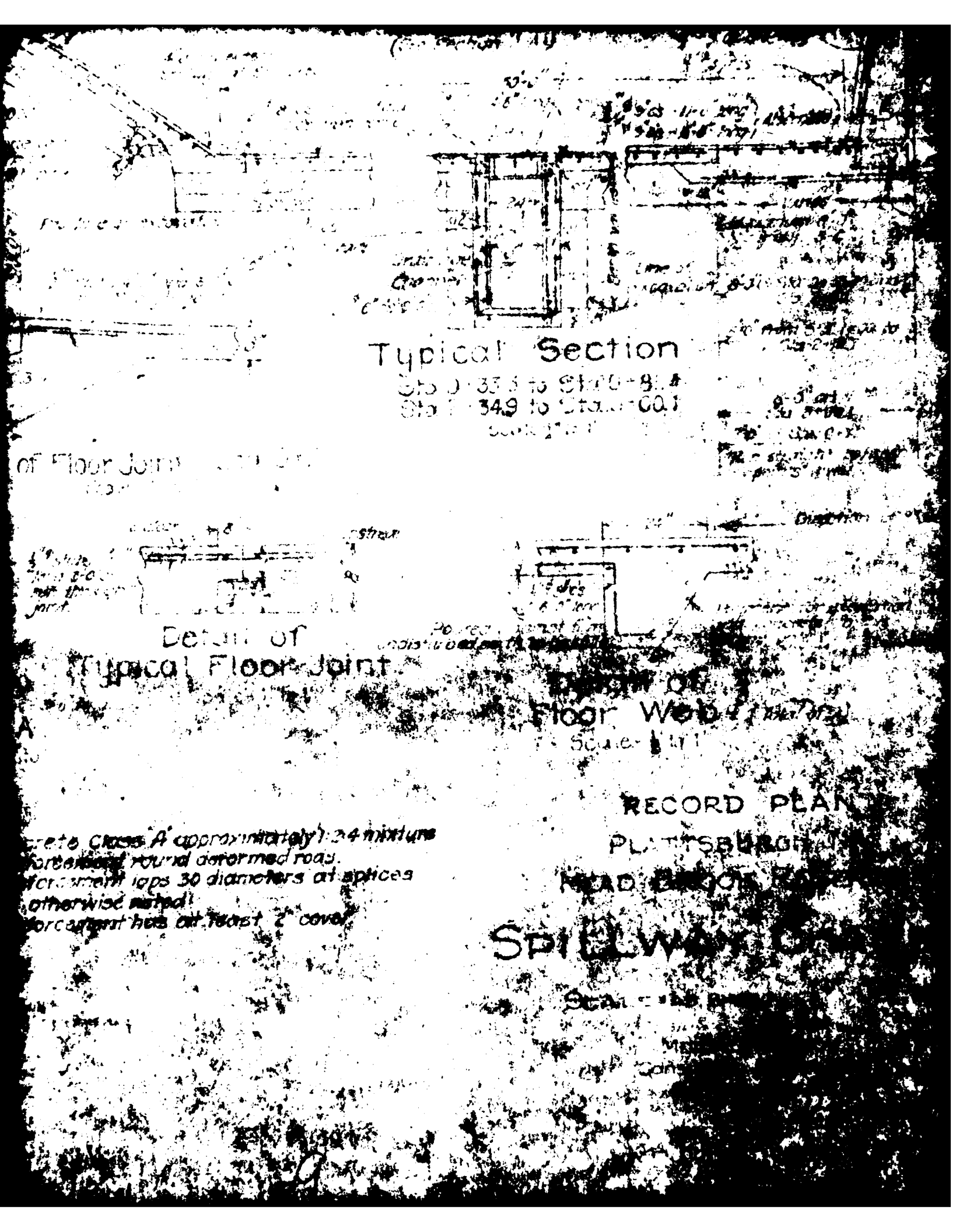

Slope
Typical Section
Typical Section
General Details
Construction Joint




Profile of Conc
Section E-E Scale 1" to 1
Earth Embankment
Seeded
Elev 471.0
Elev 462.0
Elev 463.3
3+50
3+00
Elev 473.0
12"
Elev 462.0
3'-0"
Section C-C
Scale 1/4" to 1'
B
Elev 467
Elevation of East End of Wall
(West end similar)


Slope Slab Sta. 1+93 to Sta. 3+00.1
Scale ¼" to 1'
of Concrete Drain
Profile
Section B-B
Scale ½" to 1'


Section A A
Plan
Notes :



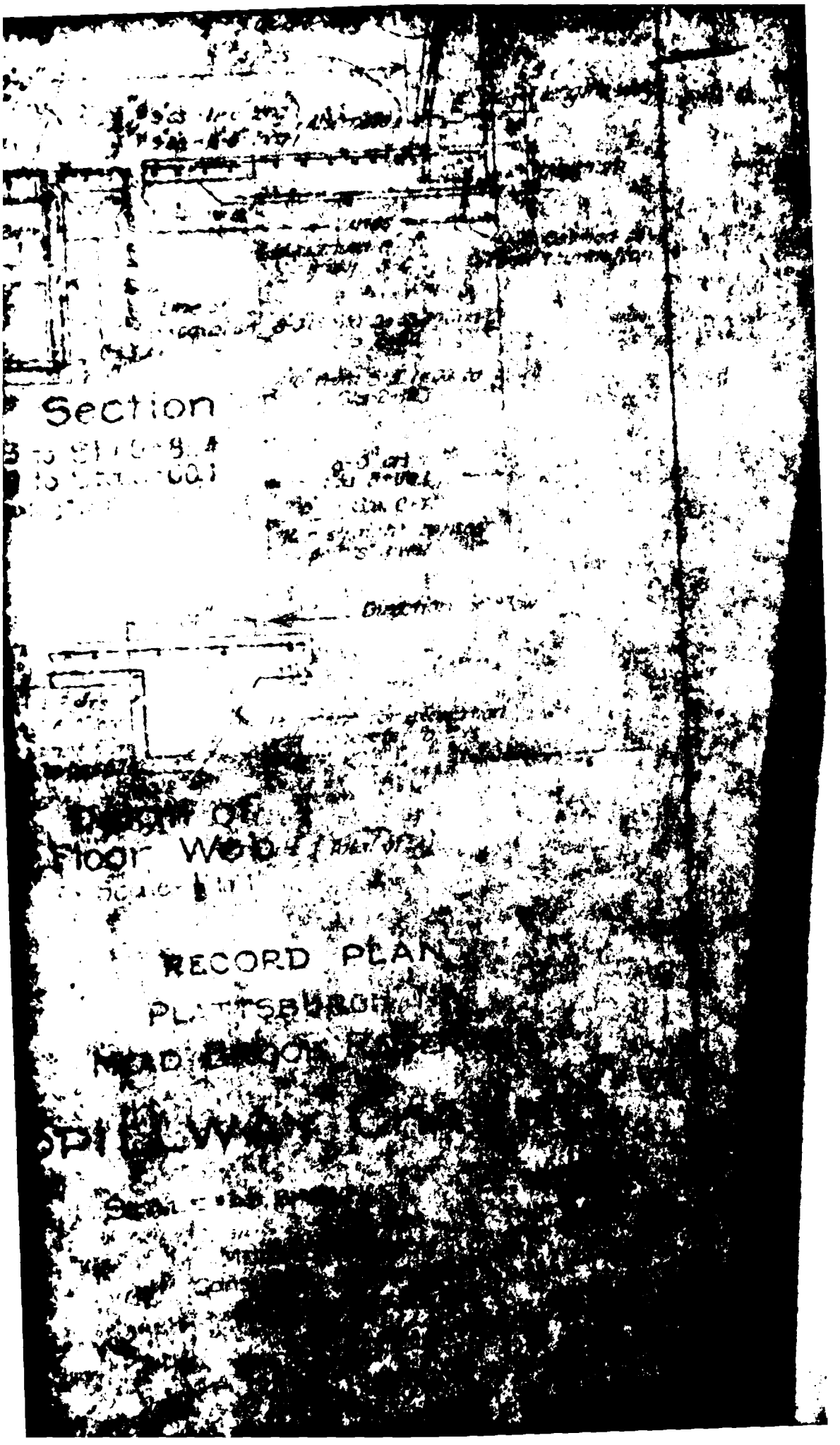
Typical Section

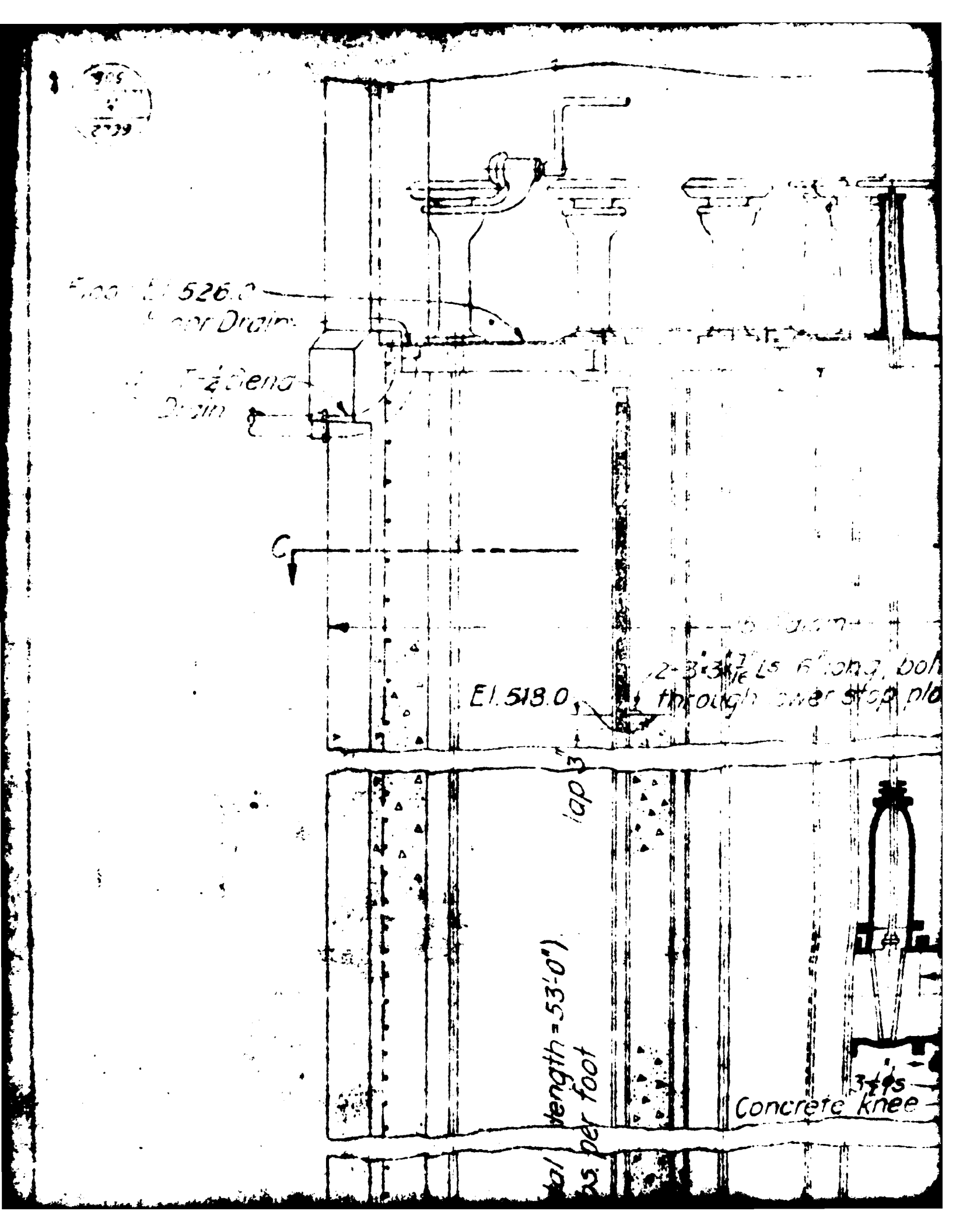
Detail of Typical Floor Joint

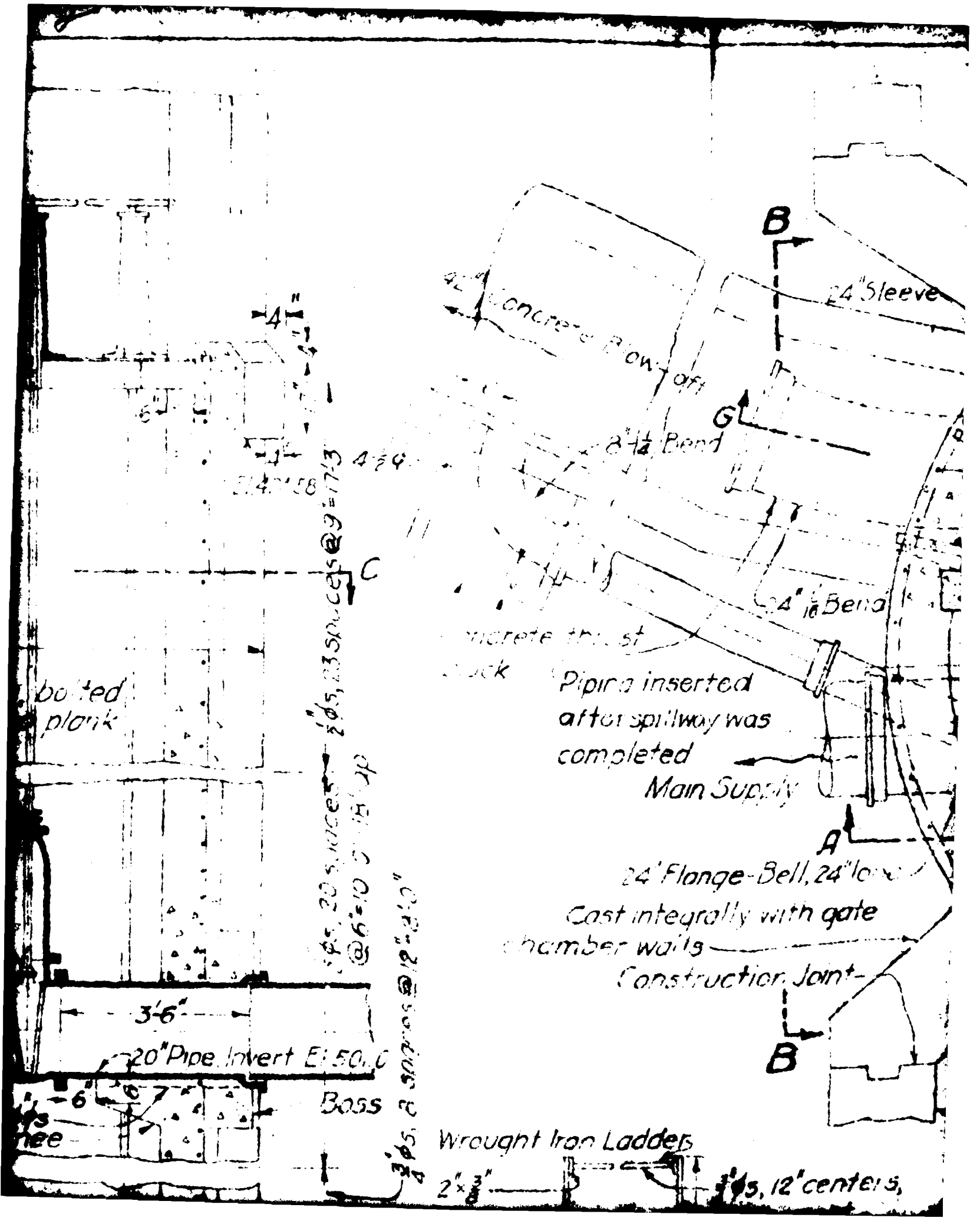
Detail of Floor Web

RECORD PLAN

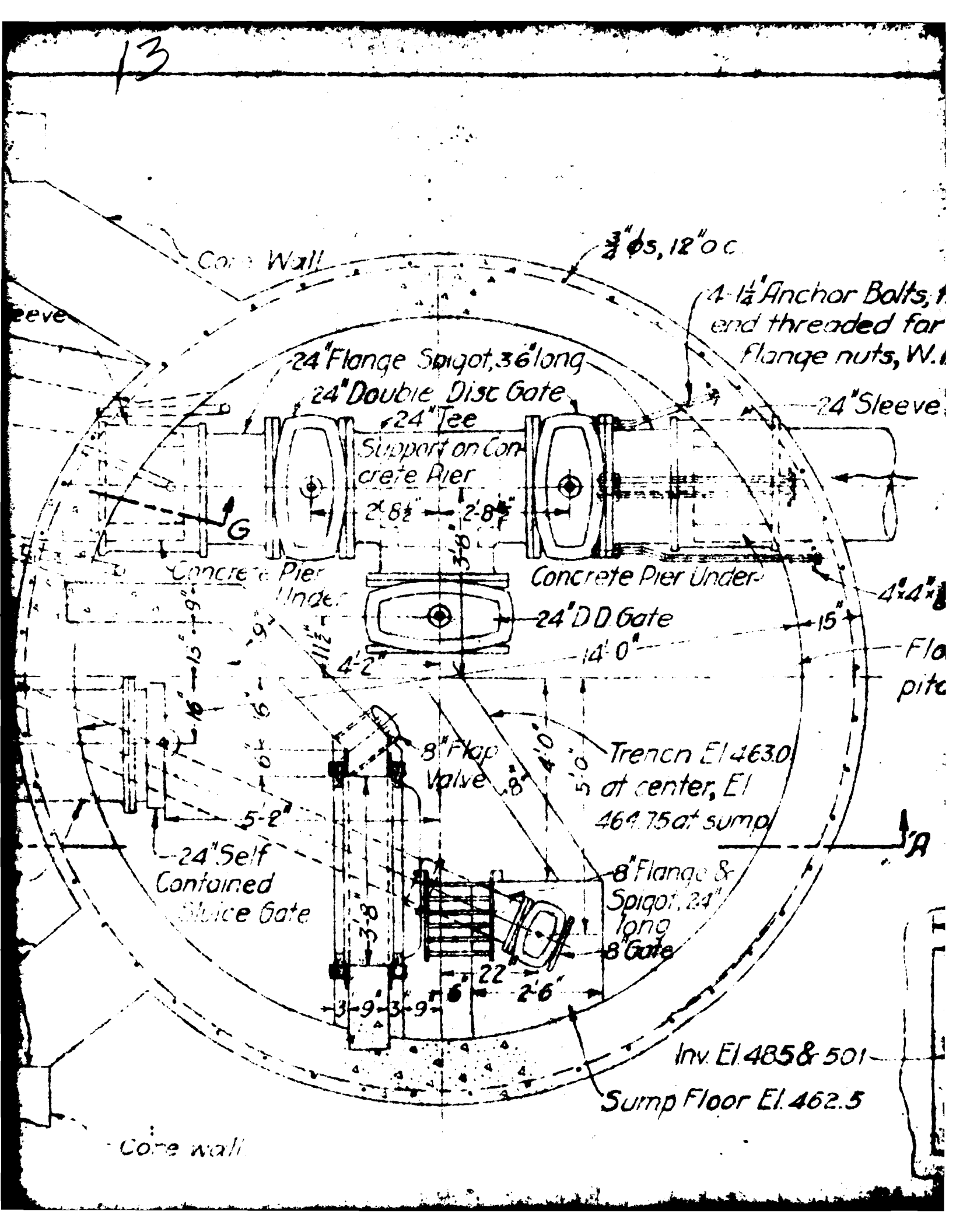
Spillway


Section
Floor Web
RECORD PLAN

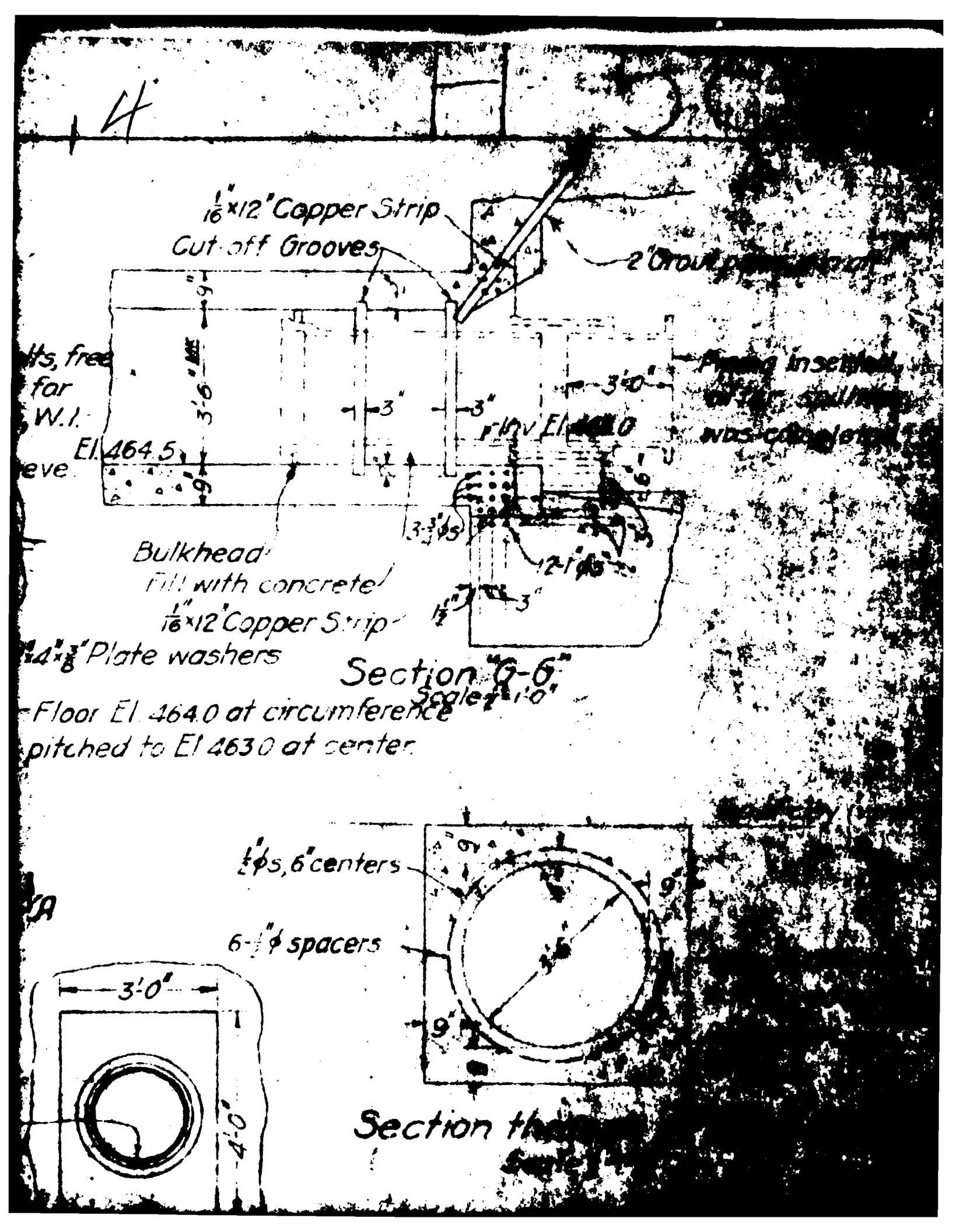

526.0
Drain
E1. 518.0
Concrete knee

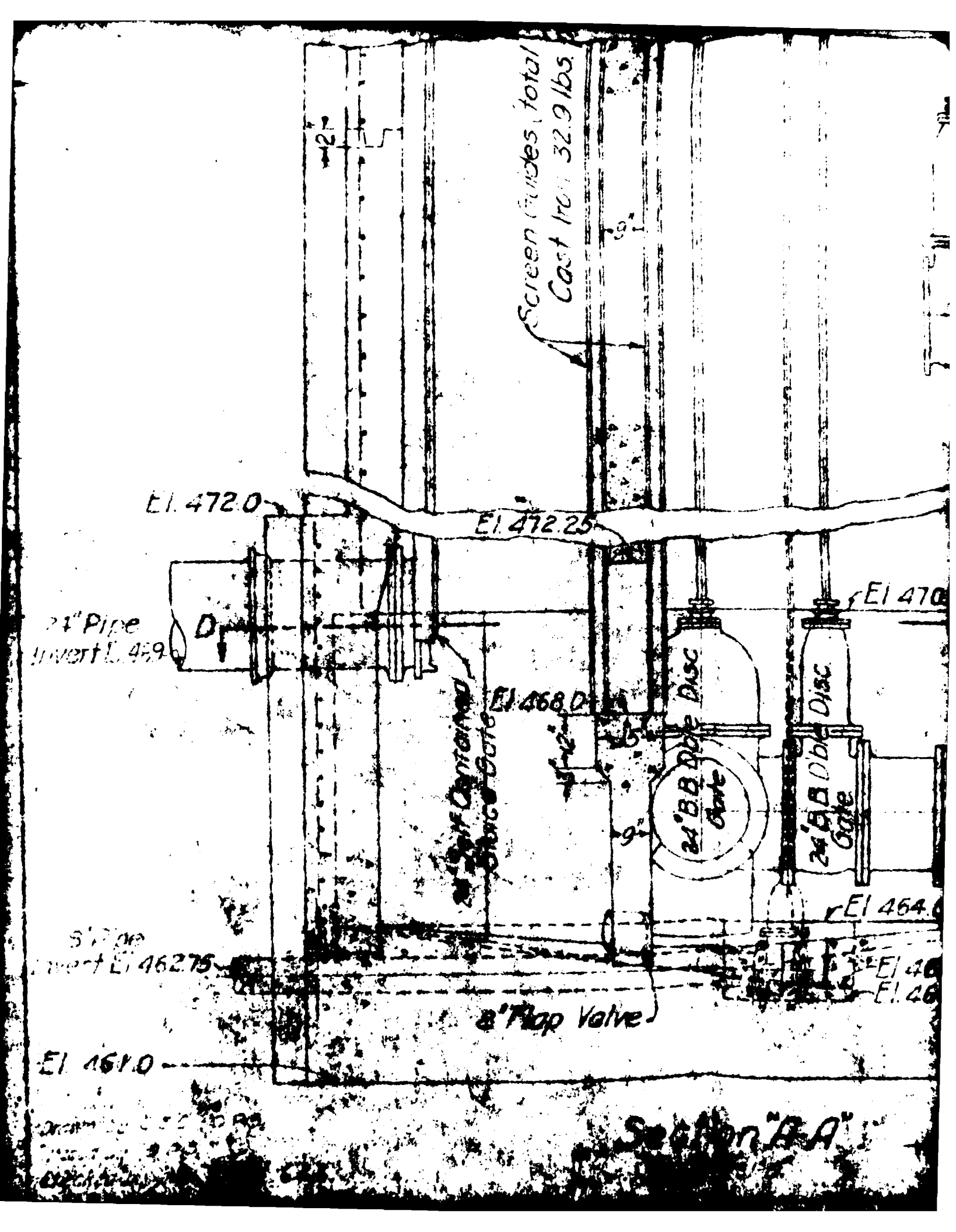

B
24" Sleeve
Concrete Blow-off
G
2-1/2 Bend
C
24" Bend
Concrete thrust
block
Pipe inserted
after spillway was
completed
Main Supply
A
24" Flange-Bell, 24" long
Cast integrally with gate
chamber walls
Construction Joint
B
bolted
plank
3'-6"
20" Pipe Invert El. 50.0
6"
Boss
Wrought Iron Ladder
2" x 3"
12" centers,

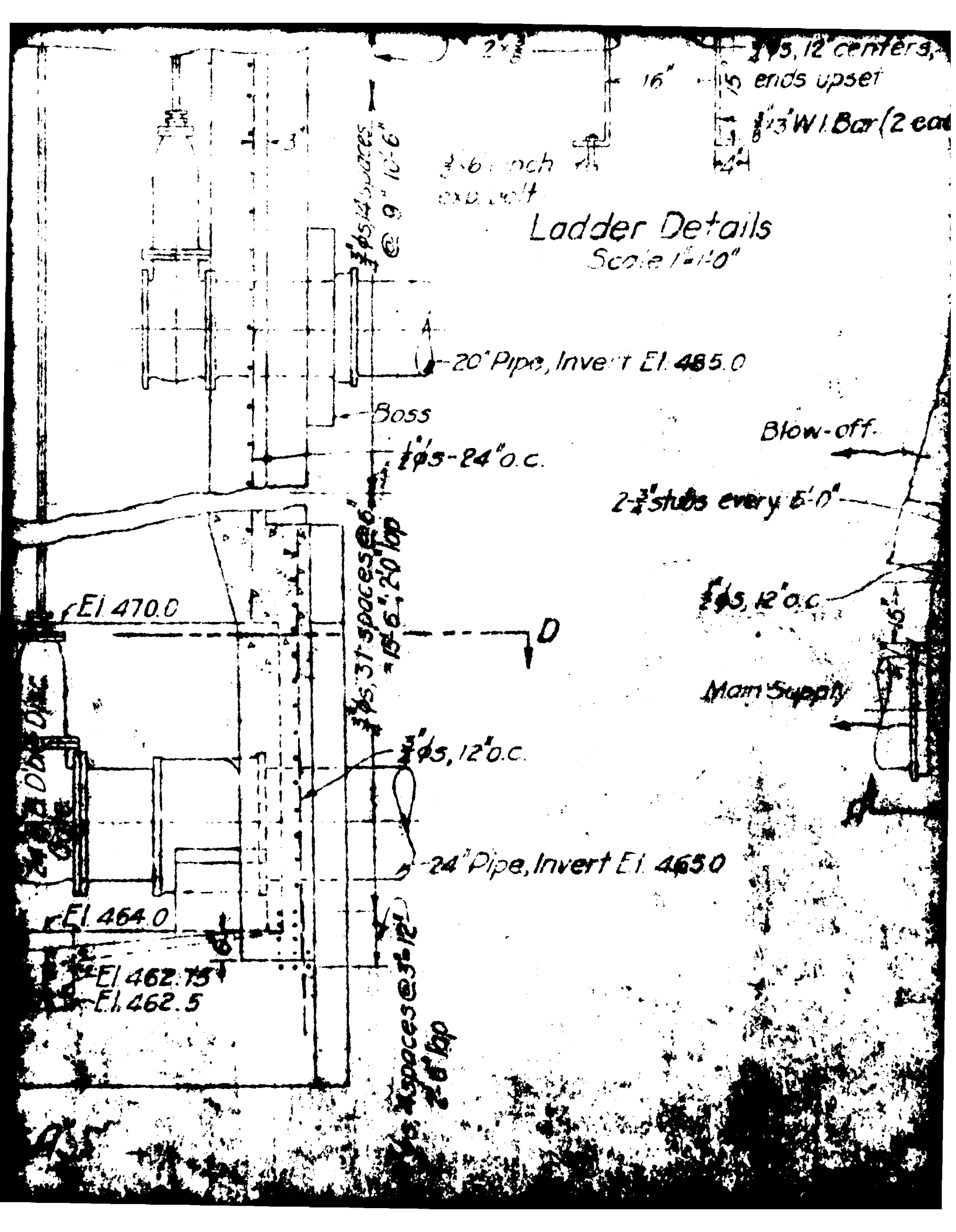
13


Core Wall
3/4" ϕs, 12" o c
4-1 1/4" Anchor Bolts,
end threaded for
Flange nuts, W.
24" Flange Spigot, 36" long
24" Double Disc Gate
24" Tee
Support on Con
crete Pier
24" Sleeve
2'-8 1/2"
2'-8"
3'-6"
G
Concrete Pier
Under
Concrete Pier Under
24" D D Gate
4"x4"
15"
14'-0"
4'-2"
9"
15"
16"
6"
8" Flap
Valve
8"
4'-0"
5'-0"
Trench El 463.0
at center, El
464.75 at sump
A
5'-2"
24" Self
Contained
Sluice Gate
8" Flange &
Spigot, 24"
long
8" Gate
3'-8"
22"
2'-6"
3'-9"
3'-9"
Inv. El 485 & 501
Sump Floor El. 462.5
Core wall

4


1/16 x 12" Copper Strip
Cut-off Grooves
2" Grout
3'-6"
3"
3"
3'-0"
El. 464.5
Bulkhead
fill with concrete
1/16 x 12" Copper Strip
3"
Section "C-6"
Scale 1"=1'-0"
Floor El. 464.0 at circumference
pitched to El. 463.0 at center
3'-0"
4'-0"
6-1" ϕ spacers
9"
9"


Screen (2 sides) total
Cast Iron 32.9 lbs
El. 472.0
El. 472.25
El 470
24" Pipe
Invert El. 459
El 468.0
24" BB Double Disc Gate
24" BB Double Disc Gate
El 464
El 46
8" Flap Valve
El. 461.0
Section "B-A"

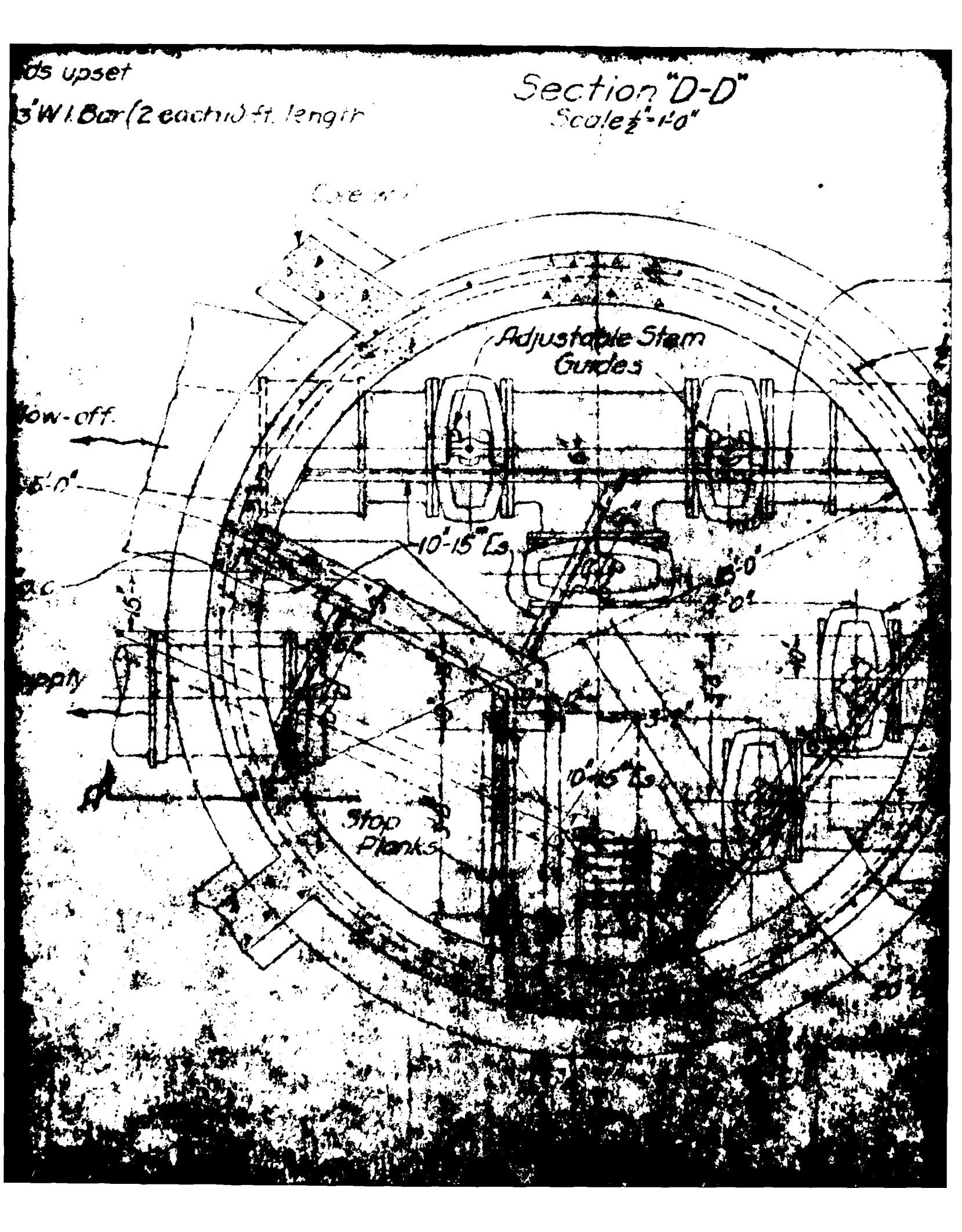

Ladder Details
Scale 1"=1'-0"
16"
20" Pipe, Invert El. 485.0
Boss
Blow-off
2-¾" studs every 5'-0"
Main Supply
24" Pipe, Invert El. 463.0
El. 470.0
El. 464.0
El. 462.75
El. 462.5
D
D'

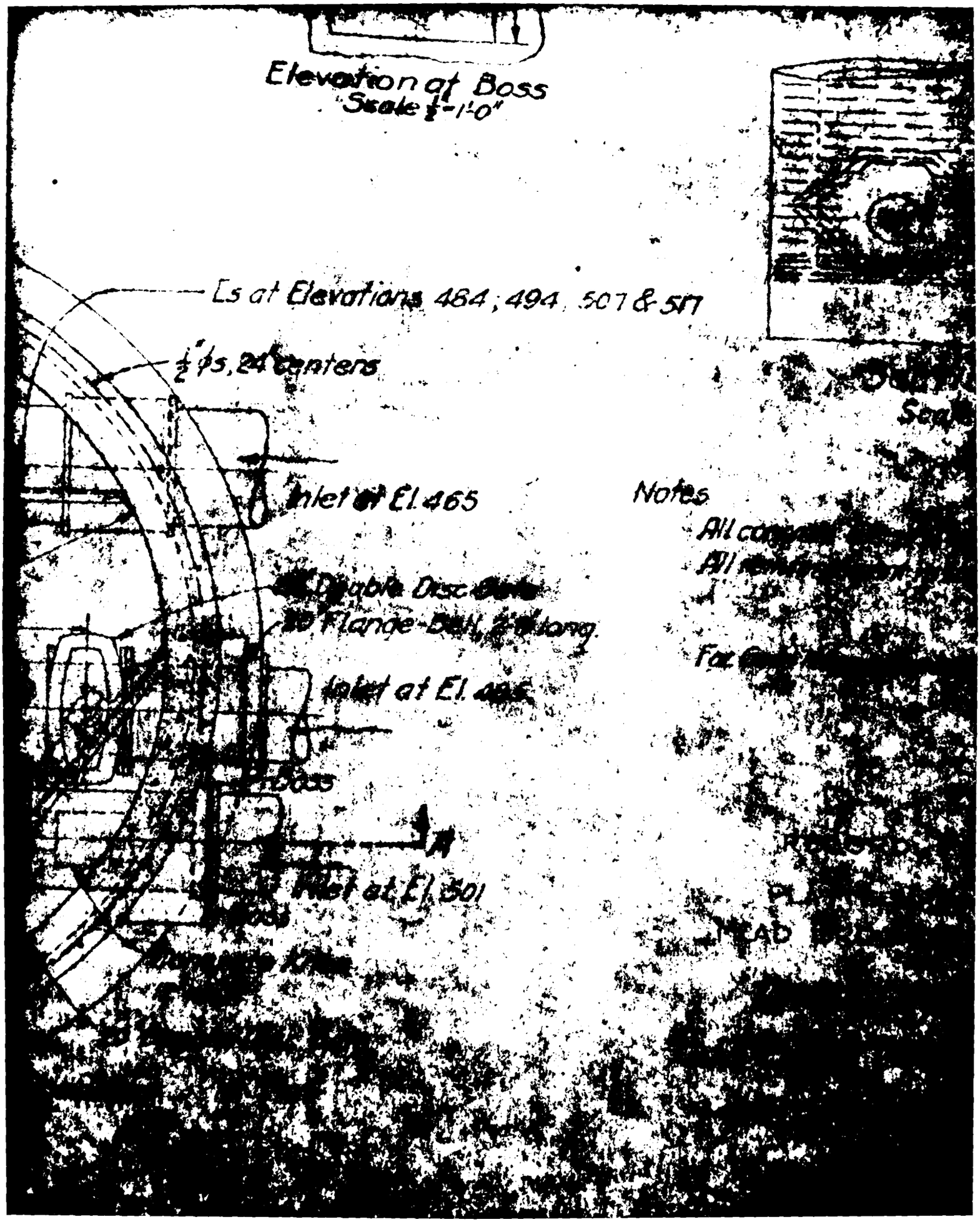
ds upset

3"W.I. Bar (2 each 10 ft. length

Section "D-D"

Scale ½"-1'-0"




Elevation at Boss
Scale 1"-1'-0"
Ls at Elevations 484; 494, 507 & 517
½" ϕs, 24 centers
Inlet at El. 465
Notes
Flange-Bell, 2' long.
Inlet at El. 486
Boss
Inlet at El. 501
HEAD

94 507 & 517

Section

Scale

Notes

All concrete

All reinforcement

long.

For

RECORD

PLA

MEAD BR